11-5865-201-12

TM 11-5865-201-12

OPERATOR'S AND AVIATION UNIT
MAINTENANCE MANUAL

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APPENDIX A-1

Countermeasures Set AN/ALQ-156 (V)1

(NSN 5865-01-145-5197)

HEADQUARTERS, DEPARTMENT OF THE ARMY

D 101.11:

March 1984

READEX FICHE best copy available

ELECTROMAGNETIC RADIATION IS PRESENT. Do not stand within three feet of the transmit antenna when the equipment is on. High frequency electromagnetic radiation can cause internal burns without causing any sensation of heat. If you feel the slightest warming effect while near the transmit antenna, move away quickly.

High voltage is used in the operation of this equipment. Avoid contacting high-voltage connections when installing or operating this equipment. Injury or death may result if personnel fail to observe safety precautions.

Adequate ventilation should be provided while using TRICHLOROTRIFLUOROETHANE. Prolonged breathing of vapor should be avoided. The solvent should not be used near heat or open flame; the products of decomposition are toxic and irritating. Since TRICHLOROTRIFLUOROETHANE dissolves natural oils, prolonged contact with skin should be avoided. When necessary, use gloves which the solvent cannot penetrate. If the solvent is taken internally, consult a physician immediately.

A minimum of two persons must be used in handling or lifting anything in excess of 40 pounds. Extreme care must be used in handling to prevent injury to the individual or damage to the equipment.

FIRST AID

5 Safety Steps to follow if someone is the victim of electrical shock

1 Do Not try to pull or grab the individual

2 If possible, turn off the electrical power

3 If you cannot turn off the electrical power, pull, push, or lift the person to safety using a wooden pole or a rope or some other insulating material

4 Send for help as soon as possible

5 After the injured person is free of contact with the source of electrical shock, move the person a short distance away and immediately start artificial resuscitation

TECHNICAL MANUAL)
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NO. 11-5865-201-12)

TM 11-5865-201-12
HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, DC, 5 March 1984

OPERATOR'S AND AVIATION UNIT MAINTENANCE MANUAL

COUNTERMEASURES SET AN/ALQ-156(V)1

(NSN 5865-01-145-5197)

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this manual. If you find any mistakes or if you know of a way to improve the procedures, please let us know. Mail your letter, DA Form 2028 (Recommended Changes to Publications and Blank Forms), or DA Form 2028-2 located in the back of this manual direct to: Commander, US Army Communications-Electronics Command and Fort Monmouth, ATTN: DRSEL-ME-MP, Fort Monmouth, New Jersey 07703.

In either case, a reply will be furnished direct to you.

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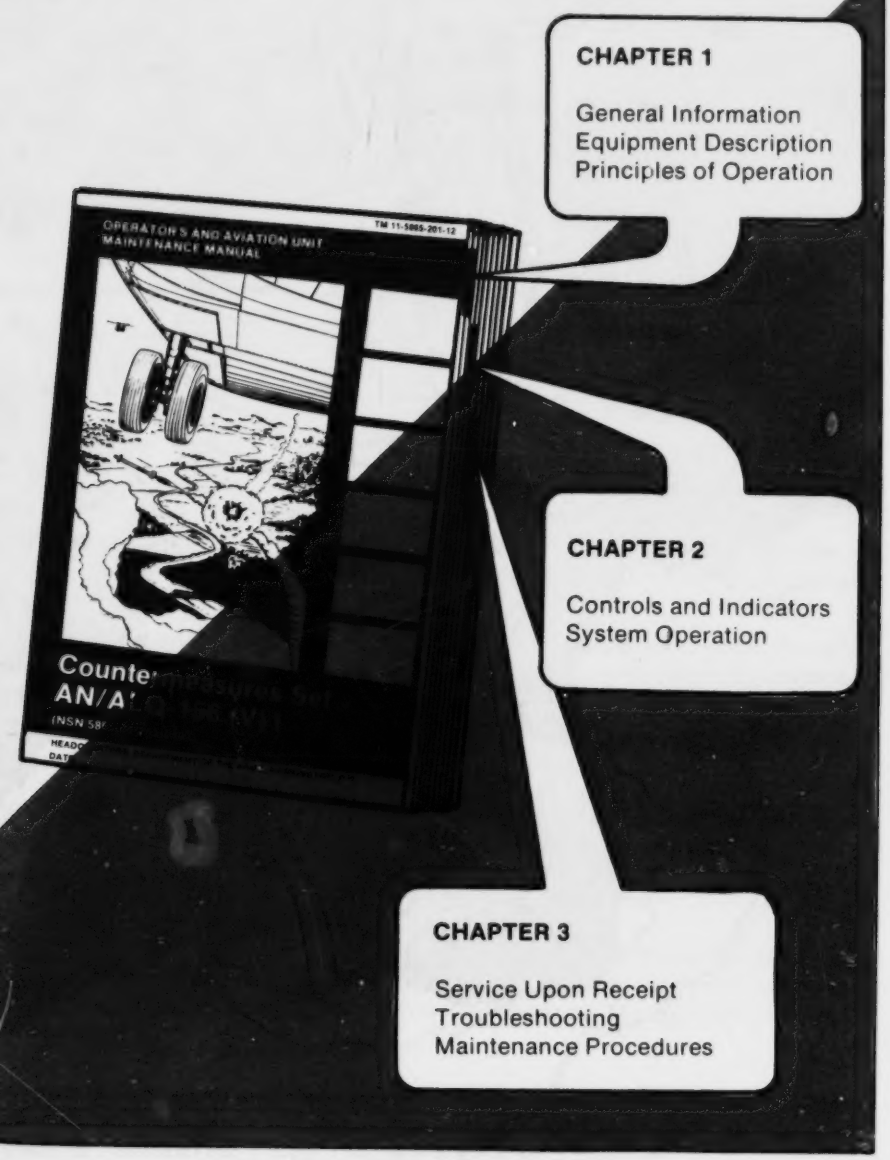
HOW TO USE THIS MANUAL

This manual shows you how to install, operate, maintain and repair the AN/ALQ-156(V)1 Countermeasures Set at the Aviation Unit Maintenance Level. Before you try to maintain this equipment you should read the manual and become familiar with its contents. Briefly, this is how the manual is organized.



CHAPTER 1 INTRODUCTION

SECTION I. GENERAL INFORMATION

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REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR) 1-2
DESTRUCTION OF ARMY MATERIEL TO PREVENT ENEMY USE 1-3
PREPARATION FOR STORAGE OR SHIPMENT 1-3
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1-1. SCOPE

This is one of a series of technical manuals describing the operation and maintenance of the AN/ALQ-156(V)1 Countermeasures Set as a typical installation on the CH-47 aircraft. It provides information required by Aviation Unit Maintenance (AVUM) personnel to service and maintain the AN/ALQ-156(V)1.

This manual contains physical and functional descriptions, inspection and servicing instructions and maintenance procedures for the AN/ALQ-156(V)1.

1-2. CONSOLIDATED INDEX OF ARMY PUBLICATIONS AND BLANK FORMS

Refer to the latest issue of DA Pam 310-1 to determine whether there are new editions, changes or additional publications pertaining to the equipment.

1-3. MAINTENANCE FORMS, RECORDS AND REPORTS

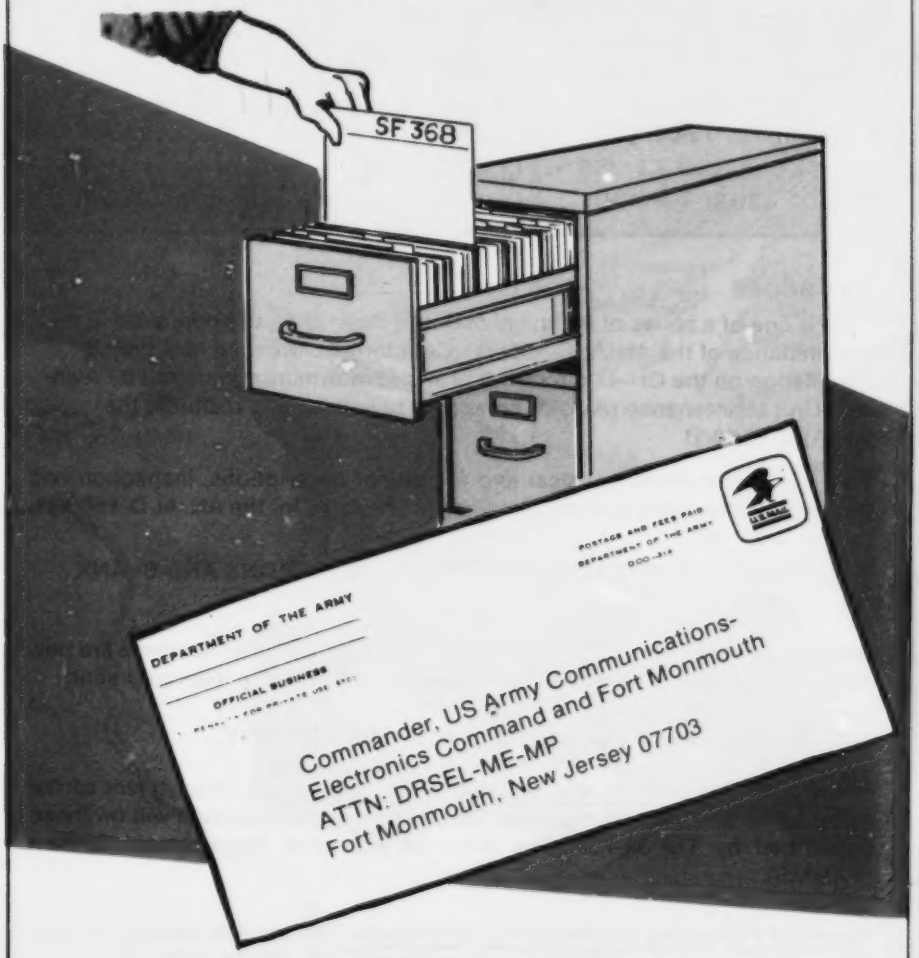
Reports of Maintenance and Unsatisfactory Equipment. Department of the Army forms and procedures used for equipment maintenance will be those prescribed by TM 38-750, The Army Maintenance Management System (TAMMS).

Report of Packaging and Handling Deficiencies. Fill out and forward SF 364 (Report of Discrepancy (ROD)) as prescribed in AR 735-11-2/DLAR 4140.55/ NAVMATINST 4355.73A/AFR 400-54/MCO 4430.3F.

Discrepancy in Shipment Report (DISREP) (SF 361). Fill out and forward Discrepancy in Shipment Report (DISREP) (SF 361) as prescribed in AR 55-38/NAVSUPINST 4610.33C/AFR 75-18/MCO P4610.19D/DLAR 4500.15.

1-4. REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR)

If your countermeasures set needs improvement let us know, send an EIR. You, the user are the only one who can tell us what you don't like about your equipment. Let us know why you don't like the design or performance. Put it on an SF 368 (Quality Deficiency Report). Mail it to us at:

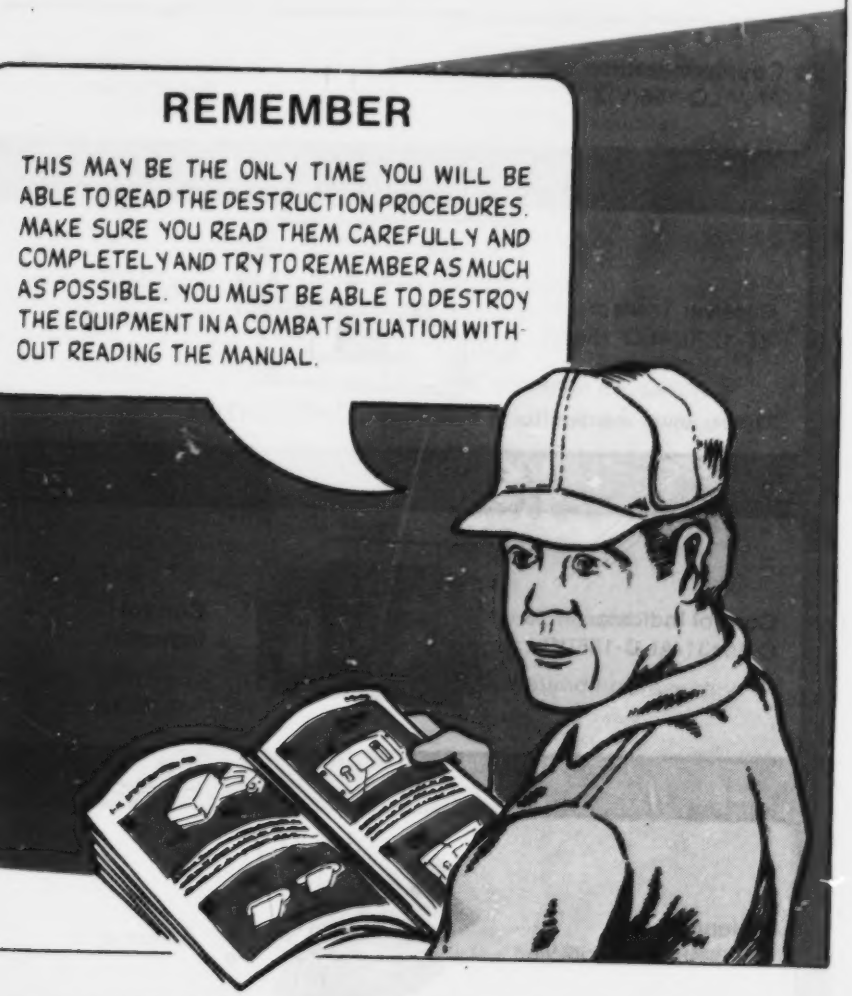


A reply will be sent to you.

5. DESTRUCTION OF ARMY MATERIEL TO PREVENT ENEMY USE

ormation describing when to destroy Army electronics materiel and the ethods for destruction are contained in TM 750-244-2.

ad TM 750-244-2 and become thoroughly familiar with the methods of struction and the situations under which the AN/ALQ-156(V)1 countermeas-es set must be destroyed.

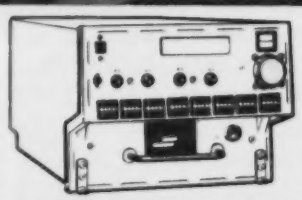
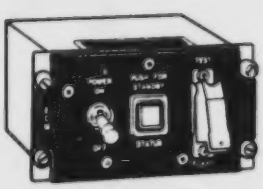
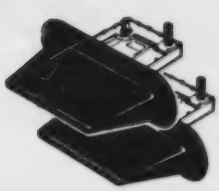

REMEMBER
THIS MAY BE THE ONLY TIME YOU WILL BE ABLE TO READ THE DESTRUCTION PROCEDURES. MAKE SURE YOU READ THEM CAREFULLY AND COMPLETELY AND TRY TO REMEMBER AS MUCH AS POSSIBLE. YOU MUST BE ABLE TO DESTROY THE EQUIPMENT IN A COMBAT SITUATION WITHOUT READING THE MANUAL.

PREPARATION FOR STORAGE OR SHIPMENT

ping and storage information and packaging information for the AN/ -156(V)1 countermeasures set are contained in Chapter 3, Section VI.

1-7. NOMENCLATURE CROSS REFERENCE LIST

The list below is a cross reference of the official and common names of the AN/ALQ-156(V)1 Countermeasures Set equipment. The common names are used throughout this manual.

OFFICIAL NAME		COMMON NAME
Countermeasures Set AN/ALQ-156(V)1		Countermeasures Set (CM set)
Receiver Transmitter, RT-1220/ALQ-156(V)		Receiver Transmitter
Control Indicator C-10131/ALQ-156(V)		Control Indicator
Antenna AS-3149/ALQ-156(V)		Antenna

The receiver transmitter is classified CONFIDENTIAL.

1. LIST OF ABBREVIATIONS

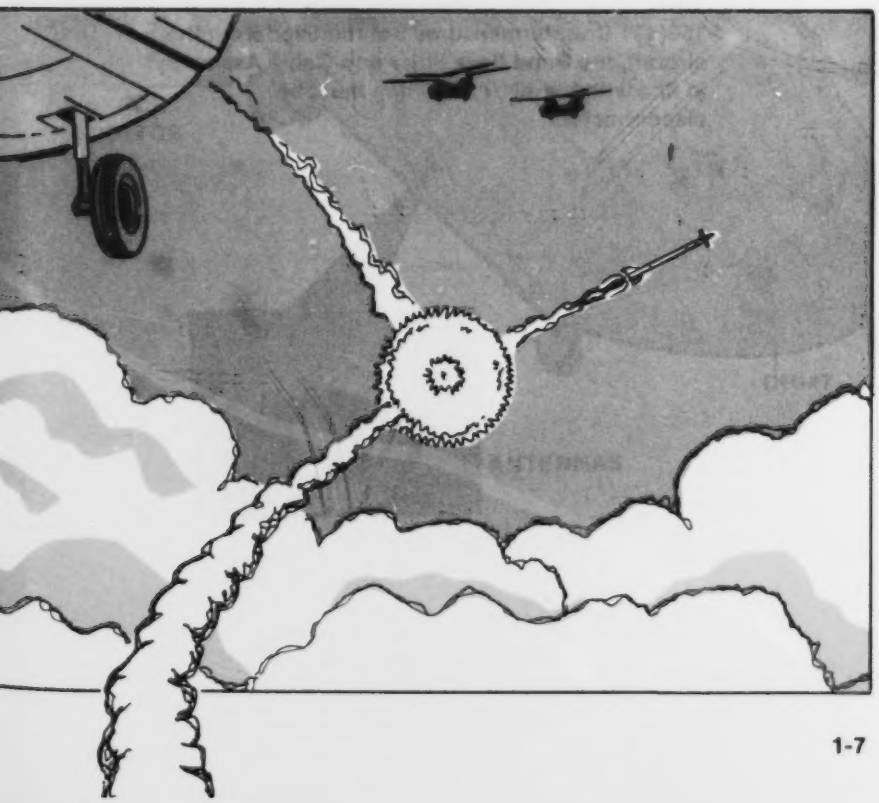
ABBREVIATION	DESCRIPTION
ac	alternating current
°C	degrees Celsius
cm	centimeter
CM set	countermeasures set
DET	detection
dc	direct current
FMO	frequency multiplier oscillator
°F	degrees Fahrenheit
Hz	Hertz
in	inch
INOP	inoperative
kg	kilogram
lb	pound
MAC	maintenance allocation chart
MSL	missile
PMCS	preventive maintenance checks and services
STBY	standby
SYS	system
TM	technical manual
V	volt(s)
VSWR	voltage standing wave ratio
WRMUP	warmup

SECTION II.
EQUIPMENT DESCRIPTION AND DATA

SECTION CONTENTS	PAGE
EQUIPMENT CHARACTERISTICS, CAPABILITIES AND FEATURES	1-7
LOCATION AND DESCRIPTION OF MAJOR COMPONENTS	1-8
EQUIPMENT DATA	1-12
SAFETY, CARE AND HANDLING	1-13

1-9. EQUIPMENT CHARACTERISTICS, CAPABILITIES AND FEATURES

The AN/ALQ-156(V)1 Countermeasures Set is an airborne radar which protects the aircraft from approaching enemy missiles. It counters the missile threat by activating launch of a flare device from the aircraft. This causes deflection of the missile away from the aircraft.



1-10. LOCATION AND DESCRIPTION OF MAJOR COMPONENTS

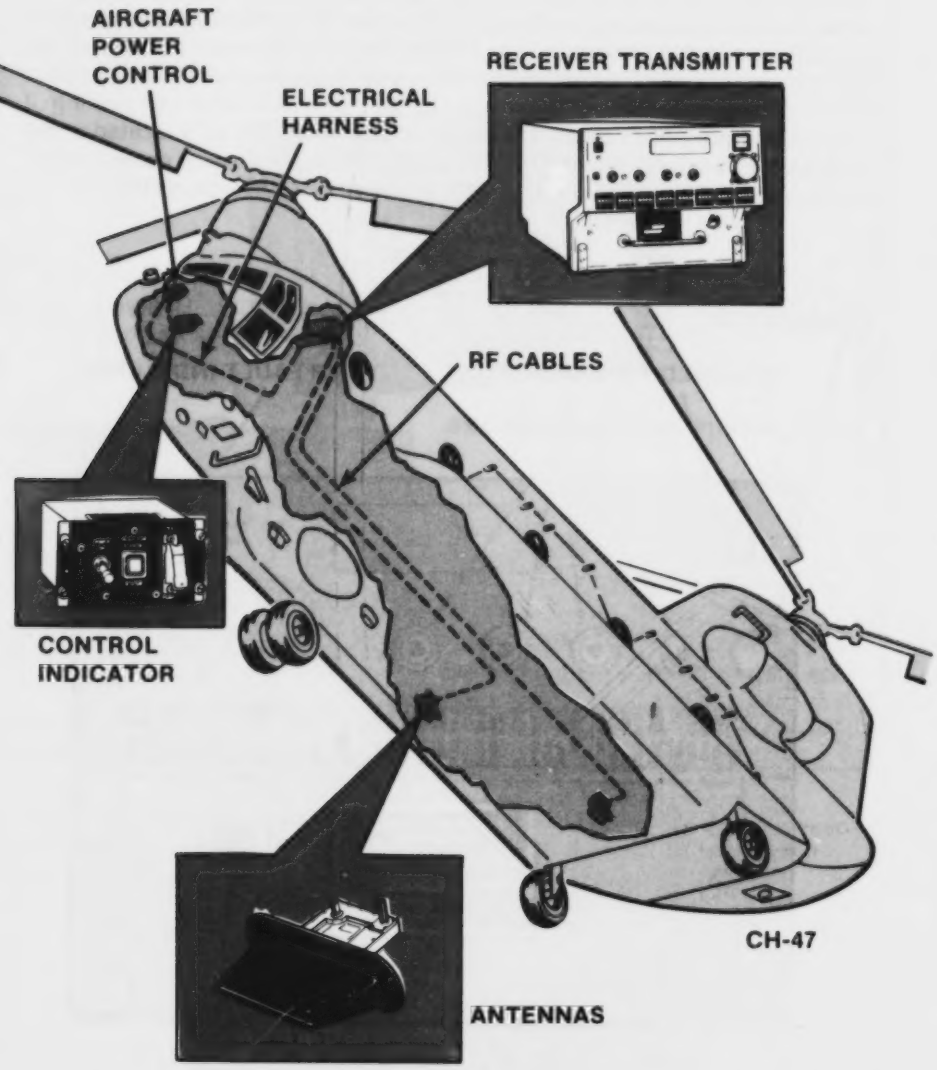
Shown below is a typical installation of the countermeasures set. The dotted line shows the wiring installed by personnel responsible for maintenance of the aircraft. It is shown for orientation purposes only. The major components of the AN/ALQ-156(V)1 countermeasures set are receiver transmitter, control indicator, and antennas. Their location in the aircraft is shown below. A description of each component is given in the following paragraphs.

NOTE

When the AN/ALQ-156(V)1 Countermeasures Set is installed in the aircraft, the Band Pass Filter and Cable Assembly must also be installed in line with the AN/APR-39(V).

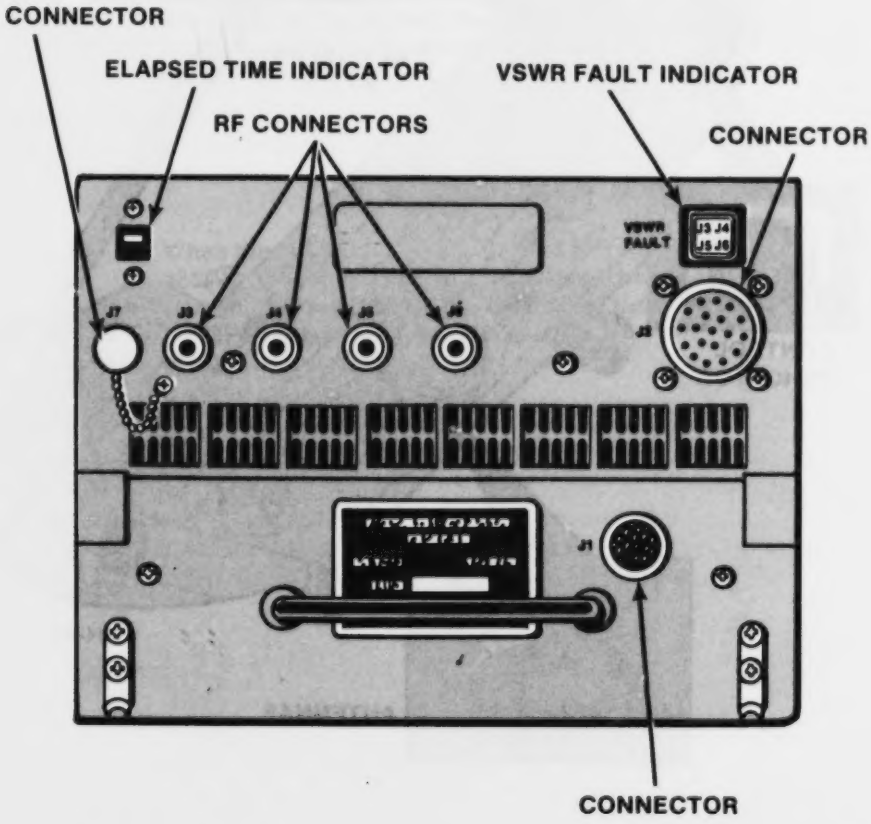
NOTE

When the aircraft is flown with the AN/ALQ-156(V)1 Countermeasures Set removed from the aircraft, the Band Pass Filter and Cable Assembly in line with the AN/APR-39(V) must be disconnected.


AIRCRAFT
POWER
CONTROL
ELECTRICAL
HARNESS
RECEIVER TRANSMITTER
RF CABLES
CONTROL
INDICATOR
CH-47
ANTENNAS

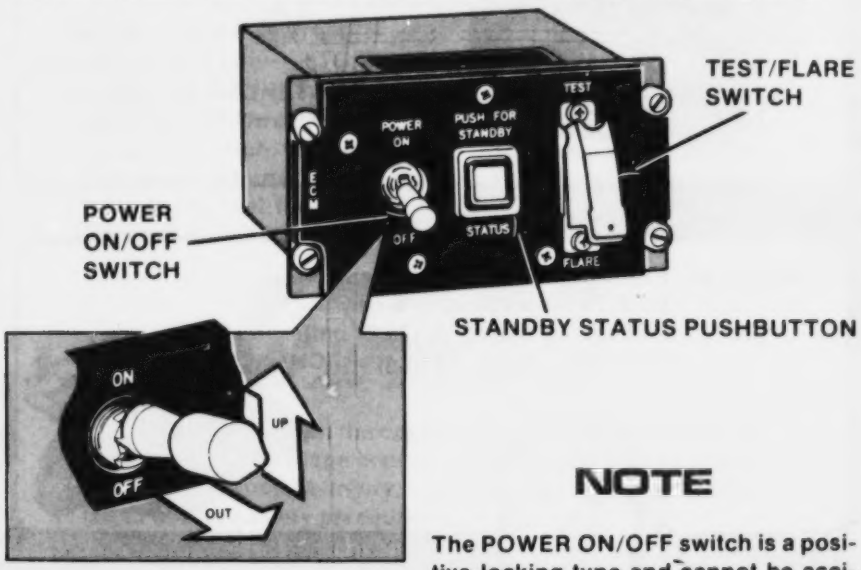
RECEIVER TRANSMITTER

The receiver transmitter is a shock-mounted assembly which contains the transmitting, receiving, synchronizing, signal processing, and low voltage dc power supply circuits used in the countermeasures set. External components include an elapsed time meter, a VSWR FAULT indicator, connectors for interconnection with the control indicator, with the antennas, and with aircraft power. A blower, located at the rear of the unit, provides forced air cooling of internal components from air drawn in through an intake grid located in the front panel. The receiver transmitter is located in the electronics compartment of the aircraft. The receiver transmitter is classified CONFIDENTIAL.



CONTROL INDICATOR

The control indicator is designed to mount in the aircraft instrument panel. It contains the controls and status indicators required for system operation. The unit has a POWER ON/OFF switch, a PUSH FOR STANDBY/STATUS pushbutton, and a TEST/FLARE switch. There is a dual status indicator which indicates the system status condition. The indicators are STBY and WRMUP. The front panel of the control indicator is illuminated by integral lighting.

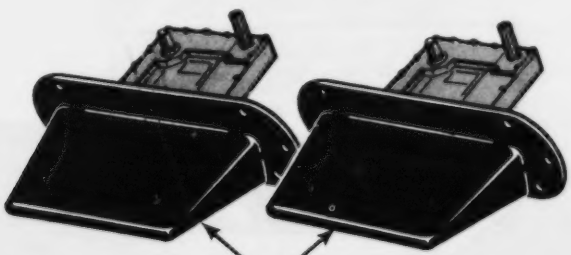


NOTE

The POWER ON/OFF switch is a positive-locking type and cannot be accidentally shut off.

ANTENNAS

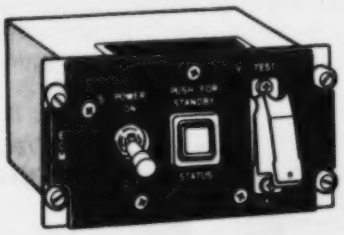
The two identical antennas are used for transmission of rf energy and reception of radar rf echos. The antennas are located on the underside of the aircraft. Each antenna unit is covered by a protective radome.



1-11. EQUIPMENT DATA

Aircraft power supplied to the countermeasures set components is 115 V ac, 3-phase, 400 Hz and 28 V dc.

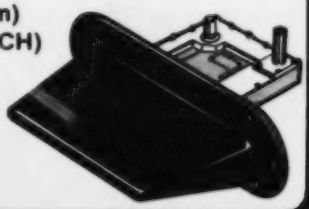
The size and weight of the major components are shown below.



CONTROL INDICATOR

HEIGHT — **3.0 in. (7.62 cm)**
WIDTH — **5.73 in. (14.55 cm)**
DEPTH — **7.09 in. (18.0 cm)**
WEIGHT — **1.7 lb. (.77 kg)**

ANTENNAS HEIGHT — **7.83 in. (19.88 cm)**
WIDTH — **3.005 in. (7.6 cm)**
DEPTH — **10.345 in. (26.27 cm)**
WEIGHT — **1.9 lb. (.86 kg) (EACH)**



RECEIVER TRANSMITTER

HEIGHT — **7.56 in. (19.2 cm)**
WIDTH — **10.22 in. (25.95 cm)**
DEPTH — **21.85 in. (55.5 cm)**
WEIGHT — **44 lb. (20.0 kg)**

1-12. SAFETY, CARE AND HANDLING

To protect yourself and the AN/ALQ-156(V)1 equipment always observe the following safety regulations. The receiver transmitter, RT-1220/ALQ-156(V), is classified CONFIDENTIAL.

ELECTROMAGNETIC RADIATION IS PRESENT. Do not stand within three feet of the transmit antenna when the equipment is on. High frequency electromagnetic radiation can cause internal burns without causing any sensation of heat. If you feel the slightest warming effect while near the transmit antenna, move away quickly.

High voltage is used in the operation of this equipment. Avoid contacting high-voltage connections when installing or operating this equipment. Injury or death may result if personnel fail to observe safety precautions.

The TEST/FLARE switch when in the up position will initiate flare launches. This switch should be used only in conjunction with the M-130 test procedures.

When the control indicator POWER ON/OFF switch on the countermeasures set is in the ON position and the M-130 system is armed, a flare launch can occur creating serious hazard to nearby personnel or equipment.

A minimum of two persons must be used in handling or lifting anything in excess of 40 pounds. Extreme care must be used in handling to prevent injury to the individual or damage to the equipment.

Be sure antennas are connected before operating equipment. Operation without a transmit antenna will damage the transmitter.

Ensure that the control indicator POWER ON/OFF switch is in the OFF position before removing or replacing the receiver transmitter. The receiver transmitter may be damaged if the countermeasures set is turned on during removal or replacement.

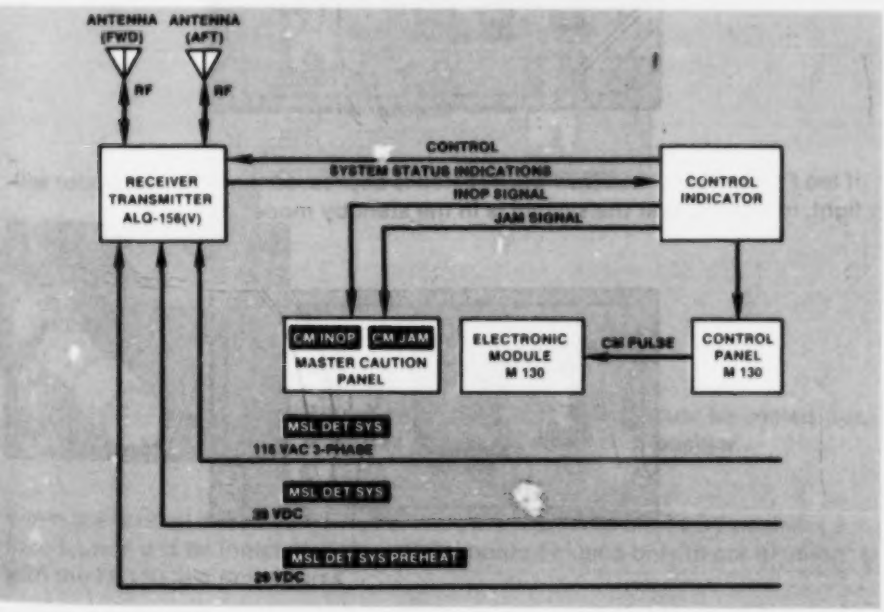
Adequate ventilation should be provided while using TRICHLOROTRIFLUOROETHANE. Prolonged breathing of vapor should be avoided. The solvent should not be used near heat or open flame; the products of decomposition are toxic and irritating. Since TRICHLOROTRIFLUOROETHANE dissolves natural oils, prolonged contact with skin should be avoided. When necessary, use gloves which the solvent cannot penetrate. If the solvent is taken internally, consult a physician immediately.

SECTION III.
PRINCIPLES OF OPERATION

SECTION CONTENTS	PAGE
BASIC OPERATION OF COUNTERMEASURES SET	1-15
INTERFACE WITH AIRCRAFT SYSTEMS, CONTROLS, AND INDICATORS	1-16

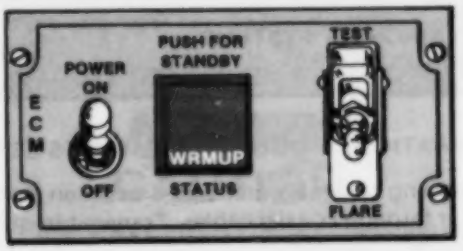
1-13. BASIC OPERATION OF COUNTERMEASURES SET

Incoming and outgoing rf signals are routed between the antennas and the receiver transmitter through coaxial cables. Transmit frequency is modulated and amplified in the receiver transmitter and routed alternately to the forward and aft antennas. During the receive interval following the transmission of each rf pulse, return signals detected by the same antenna used for transmission are routed back to the receiver transmitter for processing. If a valid target is present, the system sends a pulse to the M-130. If the system malfunctions or its performance degrades, the CM INOP caution light on the master caution panel will come on. If external jamming is encountered, internal jamming detection circuits will cause the CM JAM caution light to come on. Aircraft power supplied to the countermeasures set components is 115 V ac, 3-phase, 400 Hz and 28 V dc.

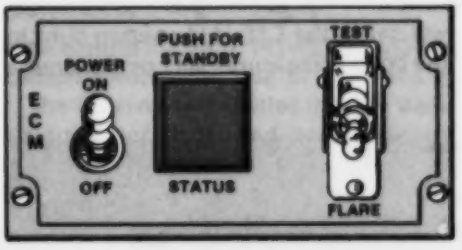


1-14. INTERFACE WITH AIRCRAFT SYSTEMS, CONTROLS, AND INDICATORS

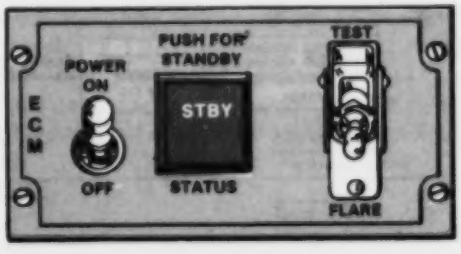
When the control indicator PUSH FOR STANDBY pushbutton is in its "out" position (not depressed) and the POWER ON/OFF switch is set to the ON position, the receiver transmitter is in the warmup mode as indicated by the STATUS indicator showing WRMUP.



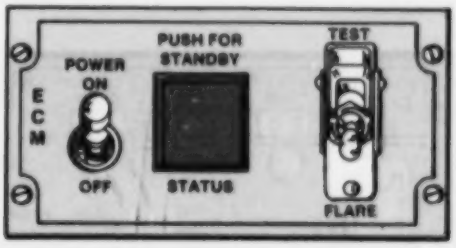
After the initial warmup period, the WRMUP lamp will go out indicating that the system is in the on mode.



If the PUSH FOR STANDBY pushbutton is depressed the STBY indicator will light, indicating that the system is in the standby mode.

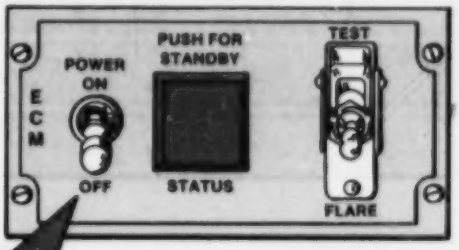


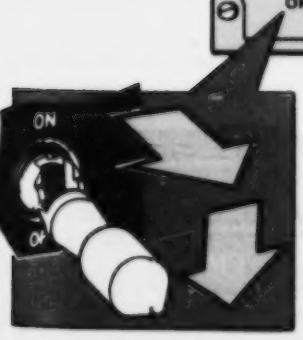
Pressing the PUSH FOR STANDBY pushbutton will then cause the STBY lamp to go out, indicating that the system is in the on mode.



Depressing the PUSH FOR STANDBY pushbutton again will cause the system to switch from the on mode to the standby mode. The actual mode is indicated by the STBY lamp. When the STBY lamp is on the system is in the standby mode. When the STBY lamp and the WRMUP lamp are both out the system is in the on mode.

To turn the countermeasures set off, set the control indicator POWER ON/OFF switch to the OFF position.



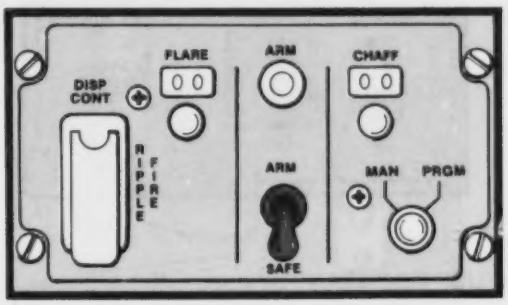


NOTE

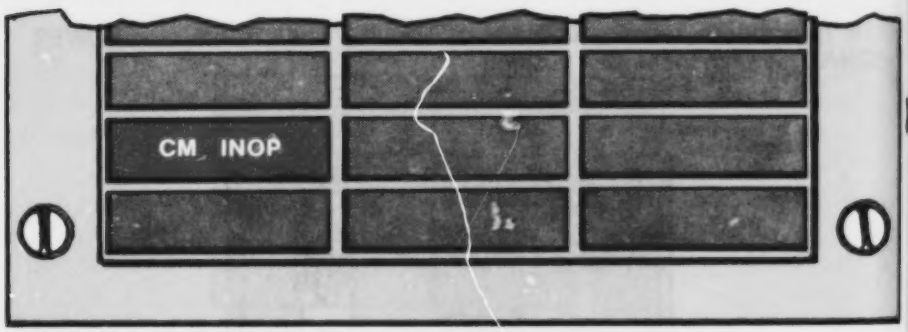
The POWER ON/OFF switch must be pulled out, then down to be set in the OFF position.

When the control indicator TEST/FLARE switch is set to the TEST position, a flare launch will be initiated. This switch should be used only in conjunction with the M-130 test procedures.

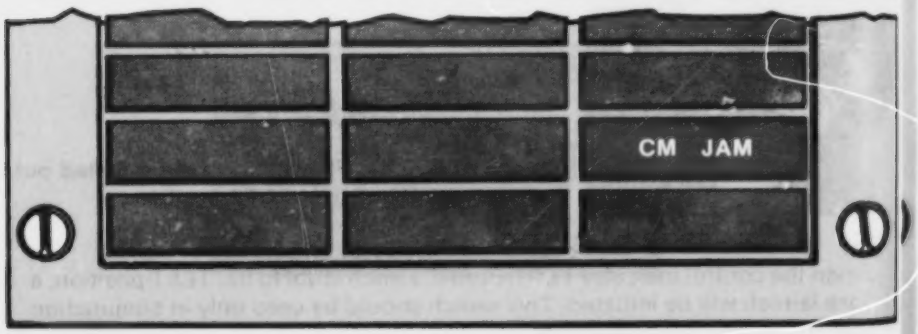
When the control indicator POWER ON/OFF switch on the countermeasures set is in the ON position and the M-130 system is armed, a flare launch can occur. Before turning the countermeasures set on, always position the M-130 system ARM/SAFE switch to the SAFE position, except when launches are permissible or desirable.



If the countermeasures set malfunctions or its performance degrades, the CM INOP caution light on the master caution panel will come on.

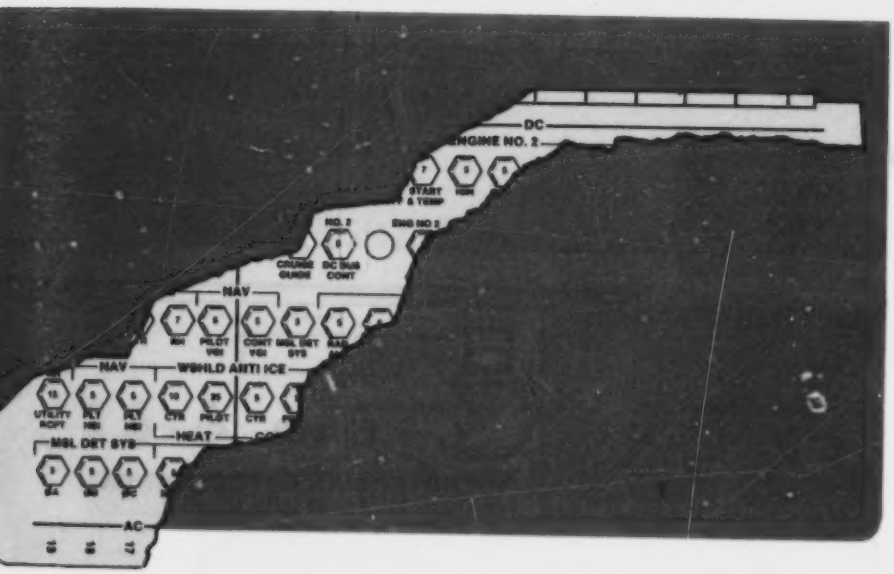


If external jamming is encountered, internal jamming detection circuits will cause the CM JAM caution light on the master caution panel to come on.



The circuit breakers for the 115 V ac, 3-phase, 400 Hz power to the countermeasures set are located on the power distribution panel. When the circuit breakers are pushed in power is supplied to the equipment. When the circuit breakers are out (not depressed) power is removed from the equipment.

The circuit breaker for the 28 V dc power to the countermeasures set is located on the power distribution panel. When the circuit breaker is pushed in power is supplied to the equipment. When the circuit breaker is out (not depressed) power is removed from the equipment.



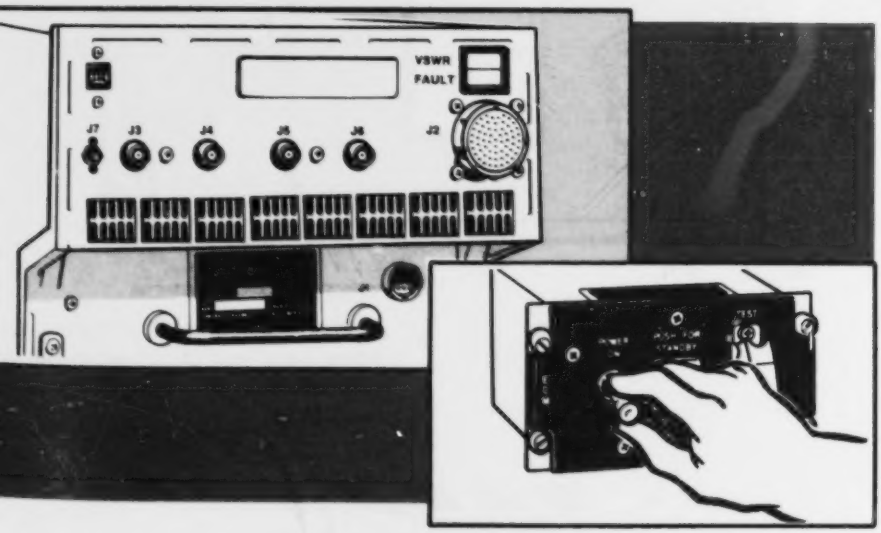
CHAPTER 2
OPERATING INSTRUCTIONS

SECTION I.

DESCRIPTION AND USE OF OPERATOR'S CONTROLS AND INDICATORS

SECTION CONTENTS — PAGE

SCOPE 2-1
CONTROL INDICATOR 2-2
RECEIVER TRANSMITTER 2-4



2-1. SCOPE

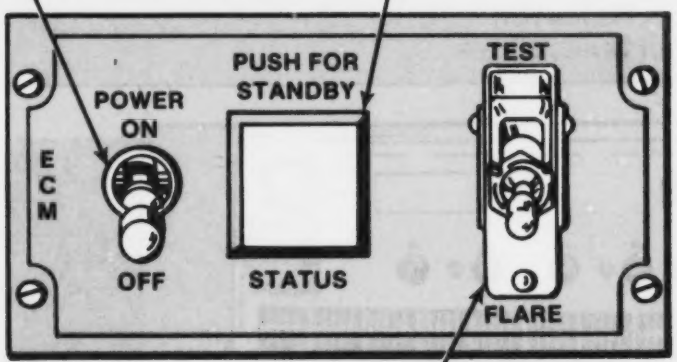
As an Aviation Unit Maintenance technician it is most important that you learn the location and purpose of controls, indicators and connectors described below. Your understanding of control settings and normal indications will help you to recognize a faulty condition if one occurs.

2-2. CONTROL INDICATOR

The controls, indicators and connectors on the control indicator are shown and described below.

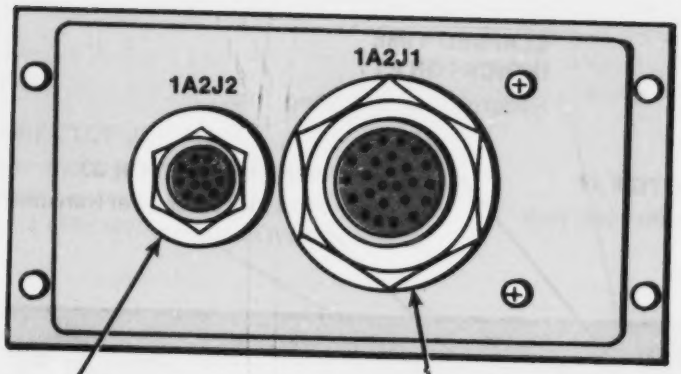
PUSH FOR STANDBY/STATUS PUSHBUTTON
Places system in standby mode or in operate mode. Upper indicator half indicates STBY in standby mode. Lower half indicates WRMUP during initial warmup interval.

POWER ON/OFF SWITCH
Places countermeasures set in operate (ON) mode.



TEST/FLARE SWITCH
Tests ALQ-156/M-130 systems. Enables flare launch when in the on (up) position when commanded by the CM set.

The TEST/FLARE switch when in the up position will initiate flare launches. This switch should be used only in conjunction with the M-130 test procedures.



CONNECTOR J2

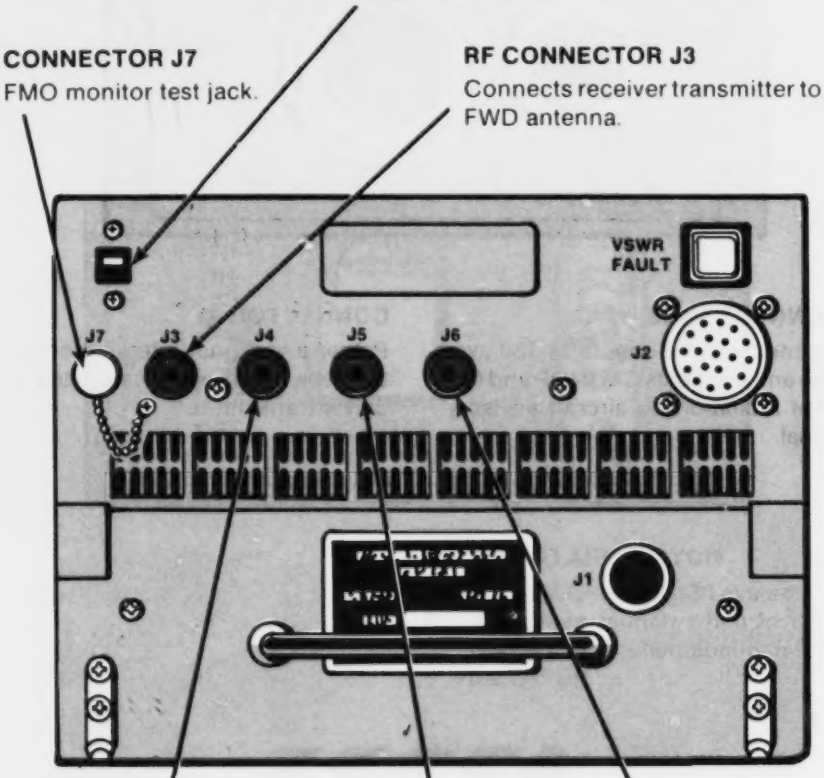
Connects CM signal to M-130 system and connects CM INOP and CM JAM indicators to aircraft advisory panel.

CONNECTOR J1

Power and signal interconnections between control indicator and receiver transmitter.

2-3. RECEIVER TRANSMITTER

The receiver transmitter indicators and connectors are shown and described below. There are no controls on the receiver transmitter.



ELAPSED TIME INDICATOR ET1
Records total operating time.

CONNECTOR J7
FMO monitor test jack.

RF CONNECTOR J3
Connects receiver transmitter to the FWD antenna.

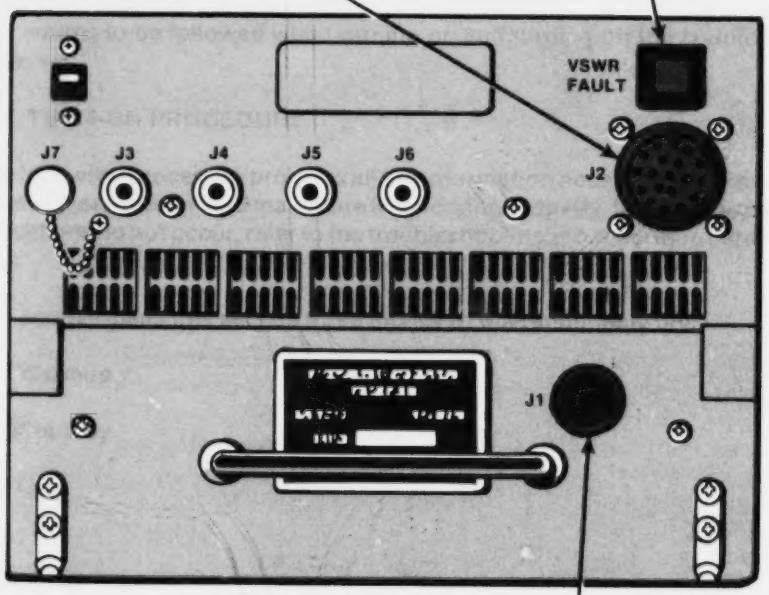
RF CONNECTOR J4
Connects receiver transmitter to the AFT antenna.

RF CONNECTOR J5
Not used.

RF CONNECTOR J6
Not used.

VSWR FAULT INDICATOR
Lights when the receiver transmitter senses a high VSWR in any antenna or antenna cabling. Lamp indicates J3 when fault is in J3 (FWD) antenna circuit and J4 when fault is in J4 (AFT) antenna circuit.

CONNECTOR J2
Power and signal interconnections between receiver transmitter and control indicator.



CONNECTOR J1
Power input to receiver transmitter.

SECTION II.

OPERATION UNDER USUAL CONDITIONS

SECTION CONTENTS	PAGE
GENERAL	2-7
TURN-ON PROCEDURE	2-7
TURN-OFF PROCEDURE	2-12

2-4. GENERAL

During normal operational conditions, the countermeasures set is turned on using the operator's control indicator. The following paragraphs describe the procedures to be followed when turning on and turning off the countermeasures set.

2-5. TURN-ON PROCEDURE

The following procedure provides all the information necessary to turn on the countermeasures set and make sure it is working properly. If any of the normal indications do not occur, refer to the troubleshooting procedures in paragraph 3-13.

The countermeasures set has three modes of operation; they are:

a. Warmup

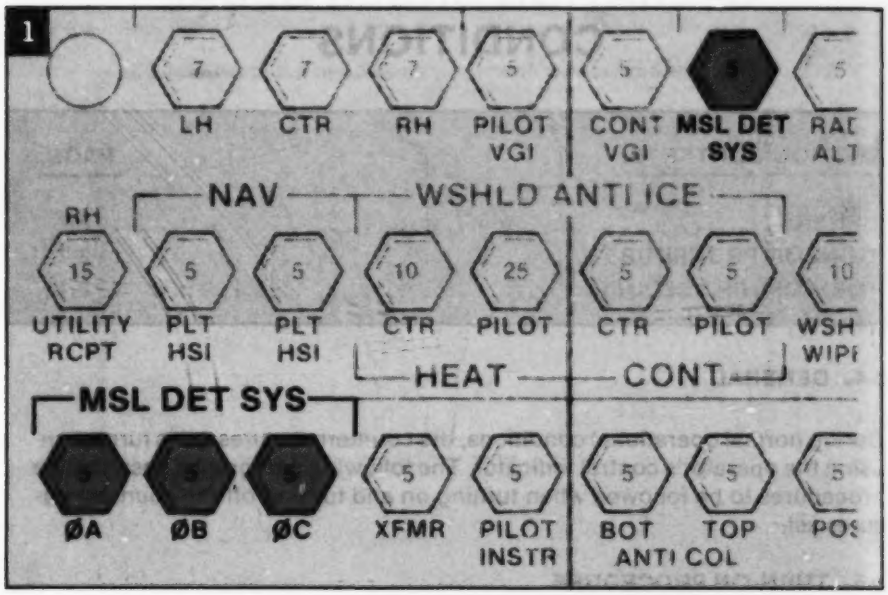
b. Standby

c. On

NOTE

Prior to performing the turn on procedure, ensure that the PUSH FOR STANDBY pushbutton is in the "out" position (not depressed).

1. Ensure that the MSL DET SYS circuit breakers located on the power distribution panel are pushed in providing 115 V ac, 3-phase, 400 Hz and 28 V dc power to the equipment.



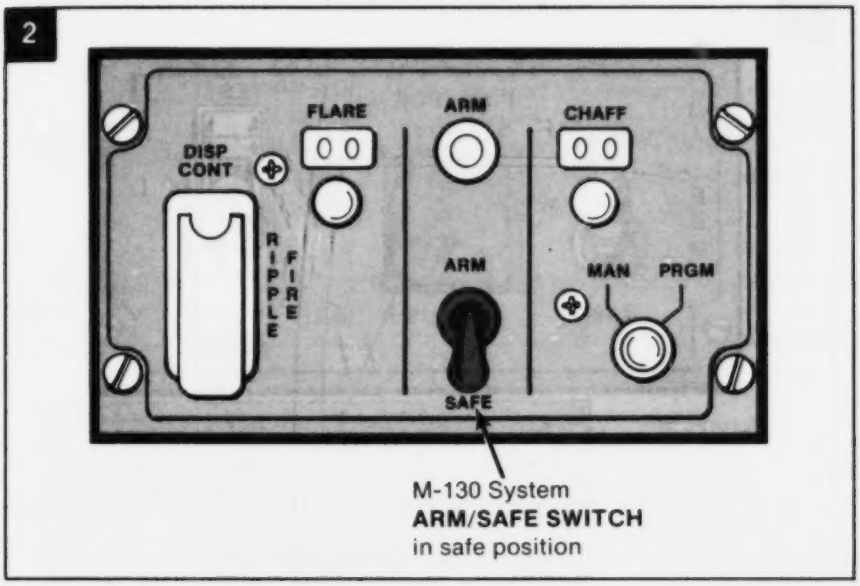
!! WARNING !!

When the countermeasures set is on, electromagnetic radiation is present. Stand clear of transmit antennas. High frequency electromagnetic radiation can cause internal burns without causing any sensation of heat.

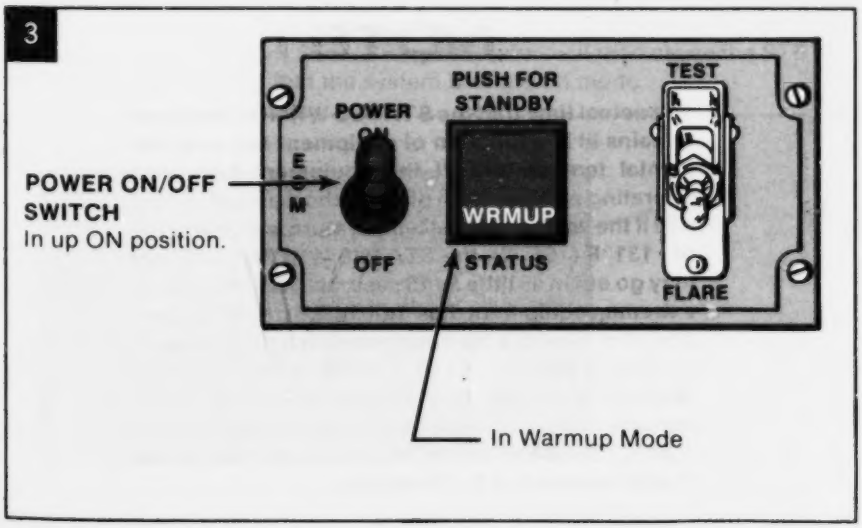
!! WARNING !!

When the control indicator POWER ON/OFF switch on the countermeasures set is in the ON position and the M-130 system is armed, a flare launch can occur creating a serious hazard to nearby personnel or equipment.

2. Before turning the countermeasures set on, position the M-130 system ARM/SAFE switch to the SAFE position, except when launches are permissible or desirable.

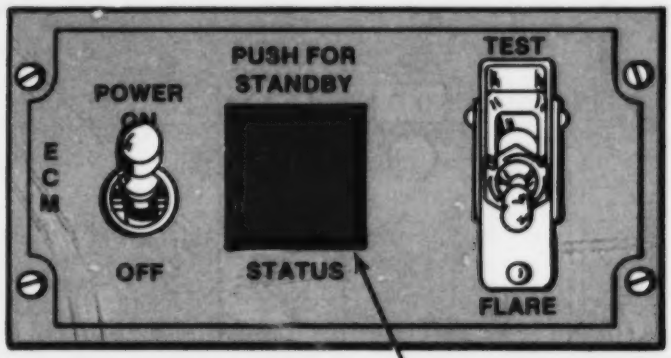


3. Set the POWER ON/OFF switch on the control indicator to the ON position. The receiver transmitter is in the warmup mode as indicated by the STATUS indicator showing WRMUP.



4. After the initial warmup period, the WRMUP lamp will go out indicating that the system is in the on mode.

4



In on Mode

NOTE

The actual time that the STATUS WRMUP indicator remains lit is a function of equipment and environmental temperature. If the equipment had been operating and has been off for a short period of time and if the environmental temperature is on the order of +131°F (+55°C), the STATUS WRMUP indicator may go out in as little as 15 seconds. At the opposite extreme, equipment has not been on for a long period of time and the environmental temperature is on the order of 67°F (55°C), the STATUS WRMUP indicator may remain lit for up to 30 minutes. However, under nominal conditions +77°F (+25°C) the STATUS WRMUP indicator will go out in approximately 8 to 10 minutes.

NOTE

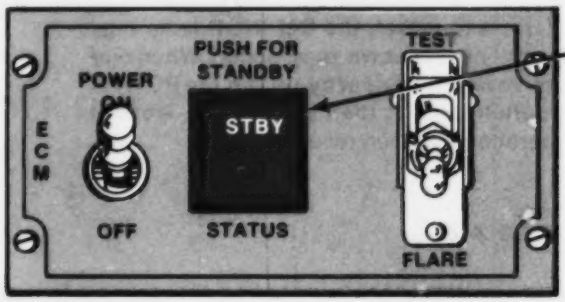
If the CM INOP indicator on the master caution panel is lit the countermeasures set is inoperative.

NOTE

If the CM JAM indicator on the master caution panel is lit, the countermeasures set cannot provide protection because of jamming or other external interference. This does not indicate that the countermeasures set is inoperative.

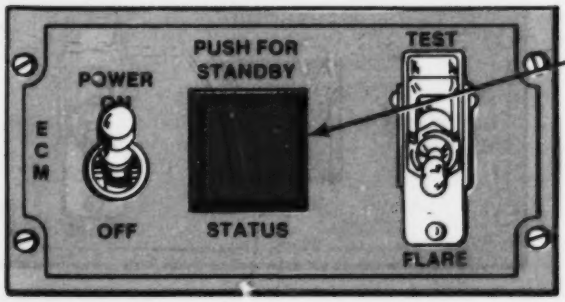
5. Depress the PUSH FOR STANDBY pushbutton to place the countermeasures set in the standby mode.

5



6. Pressing the PUSH FOR STANDBY pushbutton will then cause the STBY lamp to go out, indicating that the system is in the on mode.

6



NOTE

Subsequent depressions of the PUSH FOR STAND-BY pushbutton will cause the system to switch from the on mode to the standby mode, or vice versa.

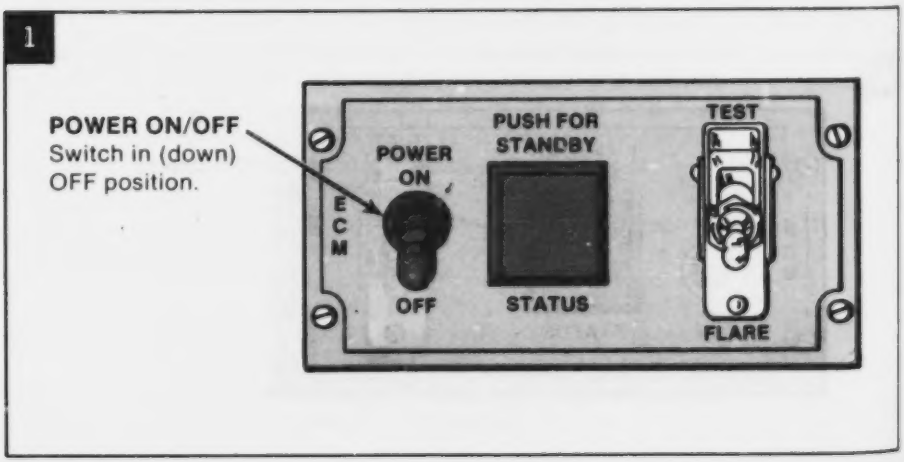
NOTE

If aircraft power is interrupted during operation of the countermeasures set, the CM INOP lamp may light and system shutdown may occur. Whenever this occurs, reset the system by setting the POWER ON/OFF switch to OFF, then back to ON. Normal system operation will then resume.

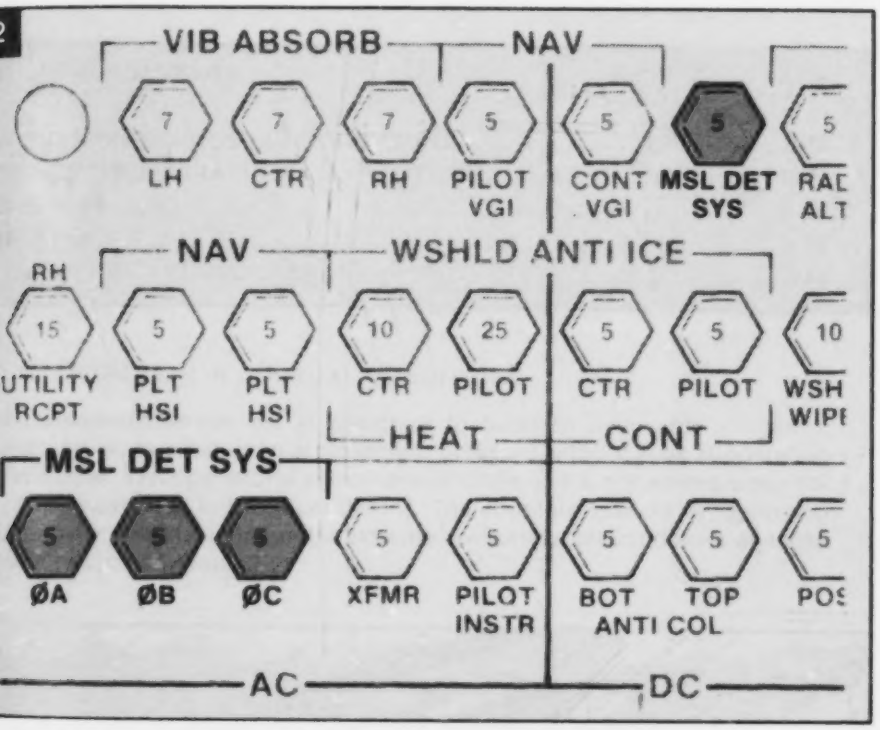
2-6. TURN-OFF PROCEDURE

The following procedure provides all the information necessary to turn off the countermeasures set.

1. Set the control indicator POWER ON/OFF switch to the OFF position.



2. Ensure that the MSL DET SYS circuit breakers located on the power distribution panel are out (not depressed) removing the 115 V ac, 3-phase, 400 Hz and 28 V dc power to the equipment.



SECTION III.

OPERATION UNDER UNUSUAL CONDITIONS

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EXTREME TEMPERATURE AND ALTITUDE 2-16
HUMIDITY 2-16
SALT WATER 2-16
EMERGENCY PROCEDURES 2-16

2-7. OPERATION IN UNUSUAL CONDITIONS

The countermeasures set is designed to function over wide ranges of temperature, humidity and atmospheric pressure without special operating procedures. The operational effectiveness of the unit is not altered when the system is exposed to these conditions. The countermeasures set operating procedures are the same under extreme environmental conditions as those described in paragraph 2-5.

2-8. EXTREME TEMPERATURE AND ALTITUDE

The countermeasures set will operate continuously in temperatures as low as -67°F (55°C) and as high as +131°F (+55°C) at altitudes from sea level 30,000 feet.

2-9. HUMIDITY

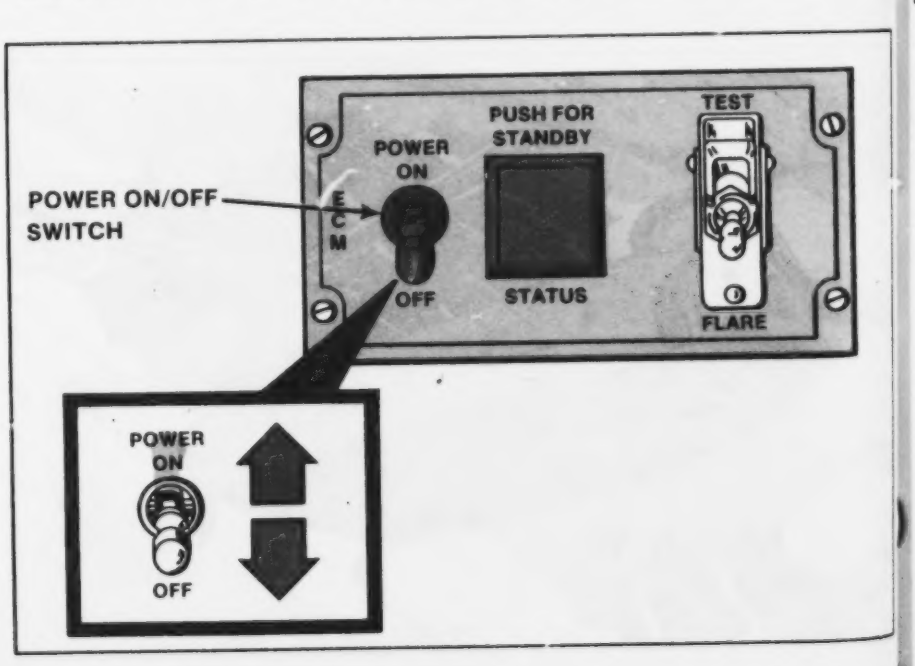
The countermeasures set will operate under relative humidity conditions up to 98%.

2-10. SALT WATER

If the countermeasures set is used for extended periods near large bodies of salt water which could cause corrosive effects to equipment, periodically clean connectors and receptacles and wipe accessible areas clean. Refer to paragraph 3-11 for cleaning instructions.

2-11. EMERGENCY PROCEDURES

If aircraft power is interrupted during operation of the countermeasures set, the CM INOP lamp may light and system shutdown may occur. Whenever this occurs, reset the system by setting the POWER ON/OFF switch to OFF, then back to ON. Within 15 seconds, normal system operation will resume.



CHAPTER 3
AINTENANCE INSTRUCTIONS

SECTION I.
REPAIR PARTS, SPECIAL TOOLS; TEST, MEASUREMENT, AND DIAGNOSTIC EQUIPMENT (TMDE); AND SUPPORT EQUIPMENT

CTION CONTENTS — PAGE

COPE 3-1
OMMON TOOLS AND EQUIPMENT 3-1
ECIAL TOOLS; TEST, MEASUREMENT, AND AGNOSTIC EQUIPMENT (TMDE); AND PPORT EQUIPMENT 3-1

. SCOPE

is chapter contains the instructions for unpacking, inspecting, installing, ecking, removing and replacing the units of the countermeasures set. It ntains the procedures required to determine if a fault exists in the counter-easures set, and if a fault does exist to isolate the fault to a replaceable unit.

2. COMMON TOOLS AND EQUIPMENT

r authorized common tools and equipment refer to the Maintenance Alloca-n Chart (MAC) in Appendix B and TM 11-5865-201-20P.

3. SPECIAL TOOLS; TEST, MEASUREMENT, AND DIAGNOSTIC EQUIPMENT (TMDE); AND SUPPORT EQUIPMENT

special tools or test equipment is required to perform maintenance at the iation Unit Maintenance (AVUM) level.

SECTION II.
SERVICE UPON RECEIPT

SECTION CONTENTS **PAGE**

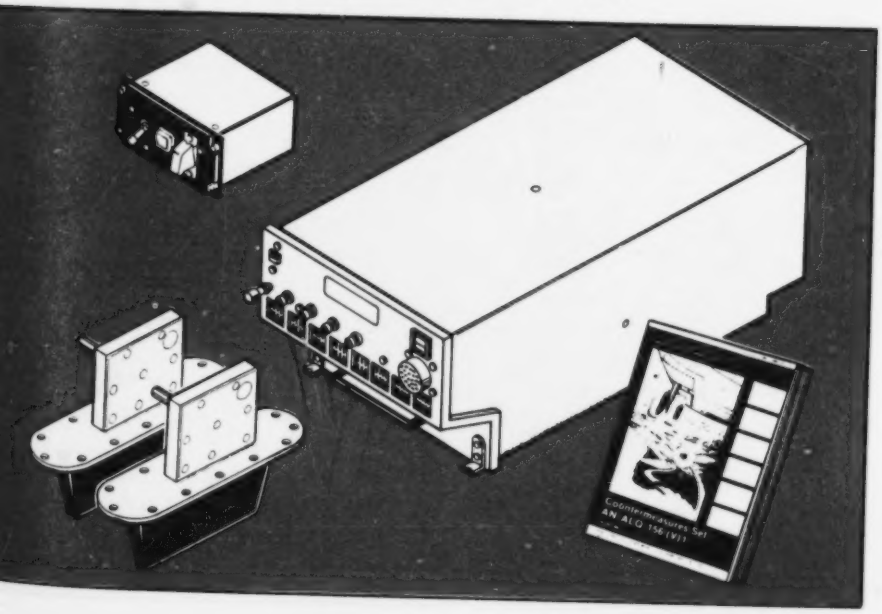
CHECKING UNPACKED EQUIPMENT 3-3
RECEIVER TRANSMITTER INSTALLATION 3-4
ANTENNA INSTALLATION 3-7
CONTROL INDICATOR INSTALLATION 3-10
PREFLIGHT TEST 3-12

3-4. CHECKING UNPACKED EQUIPMENT

Inspect the equipment for damage incurred during shipment. If the equipment has been damaged, report the damage on SF 364 Report of Discrepancy (ROD).

Check the equipment against the packing slip to see if the shipment is complete. Report all discrepancies in accordance with the instructions of TM 38-750.

Check to see whether the equipment has been modified.



3-5. RECEIVER TRANSMITTER INSTALLATION

Perform the following steps to install the receiver transmitter.

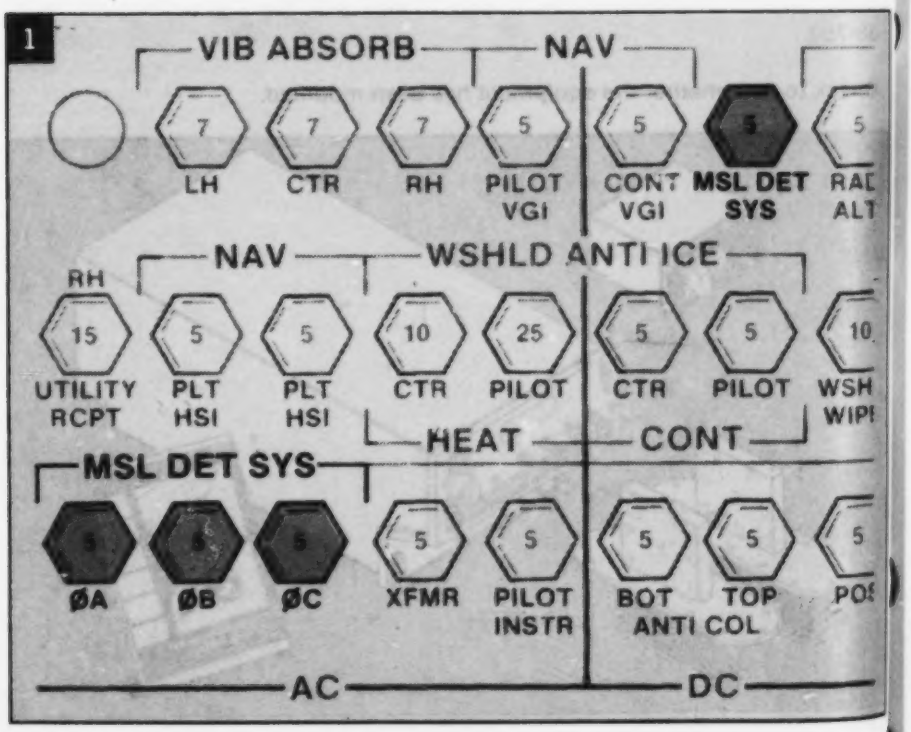
CAUTION

Ensure that the control indicator POWER ON/OFF switch is in the OFF position before installing the receiver transmitter. The receiver transmitter may be damaged if the countermeasures set is turned on during installation.

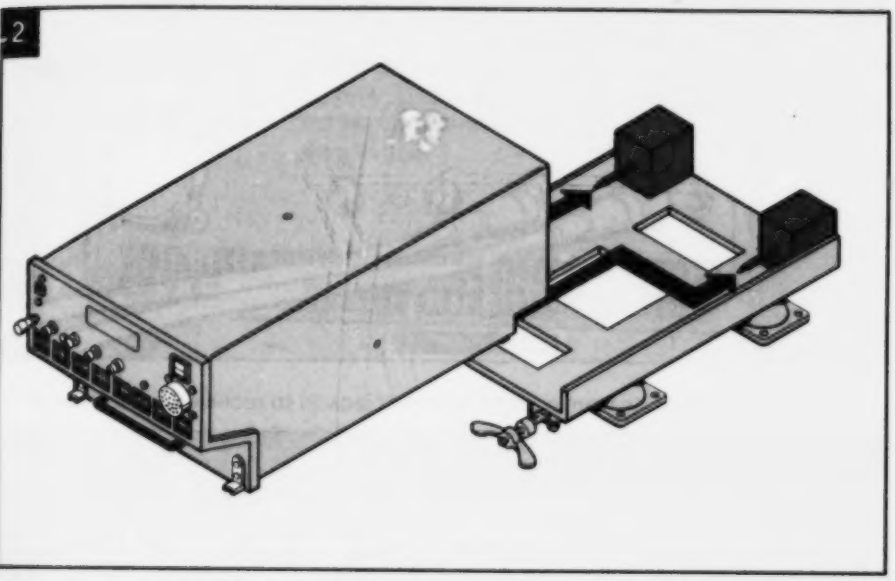
NOTE

Prior to installing the receiver transmitter, ensure that the unit has been checked and is designated ready for issue (RFI) by Aviation Intermediate Maintenance (AVIM) personnel.

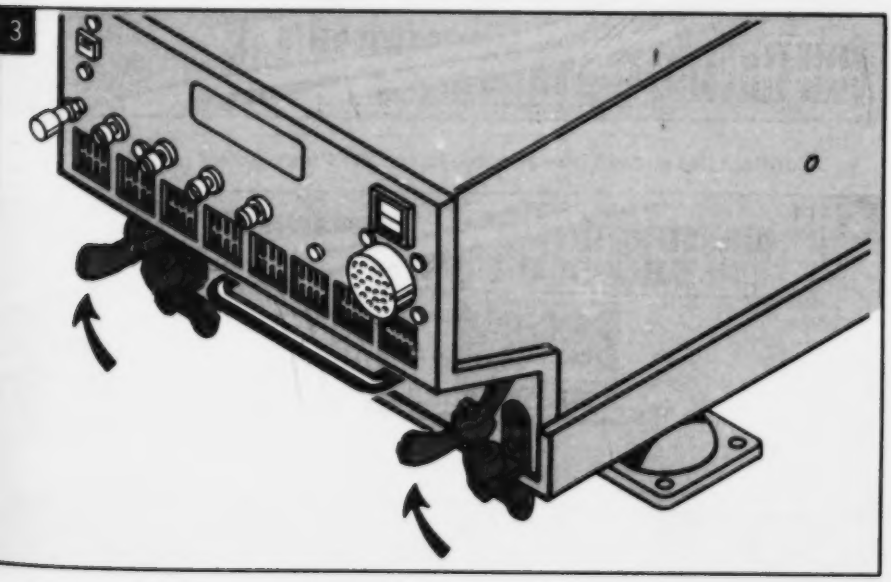
1. Ensure that the MSL DET SYS circuit breakers located on the power distribution panel are out (not depressed) removing the 115 V ac, 3-phase, 400 Hz and 28 V dc power to the equipment.



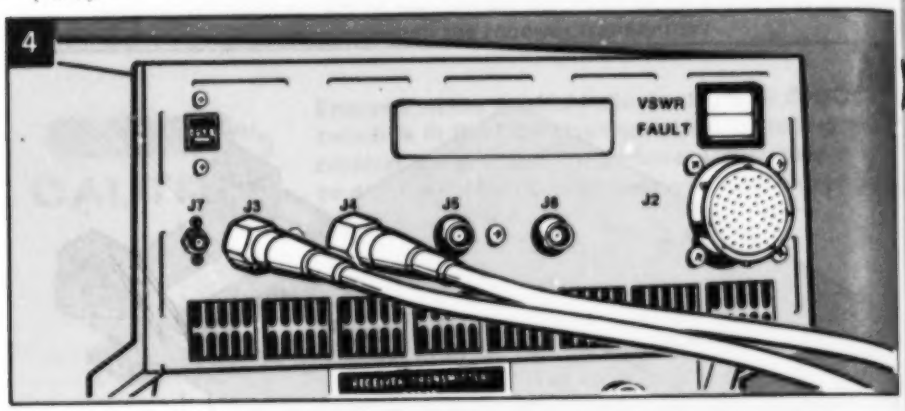
2. While holding front of receiver transmitter up, slide the receiver transmitter into its shock-mounted rack, making sure that the guide pins of the rack engage with the guide pin holes on the rear of the receiver transmitter.



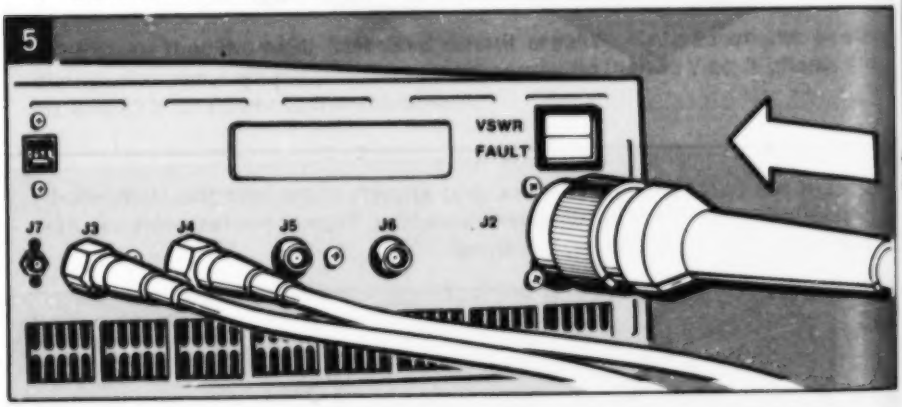
3. Lift the two locking fasteners, and engage them over the clamp-down brackets on the front of the receiver transmitter. Tighten the fasteners securely and install safety wire on each fastener.



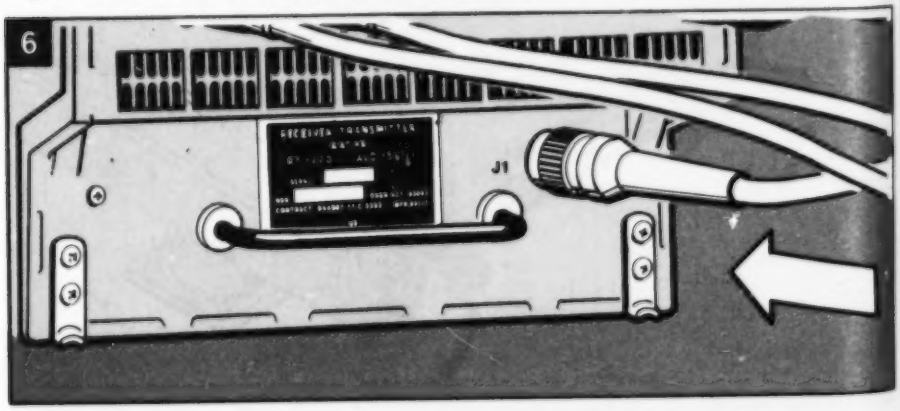
4. Connect the antenna cables to receiver transmitter jacks J3 (FWD) and J4 (AFT).



5. Connect the cable from control indicator jack J1 to receiver transmitter J2.



6. Connect the aircraft power cable to receiver transmitter jack J1.



3-6. ANTENNA INSTALLATION

Perform the following steps to install the antennas.

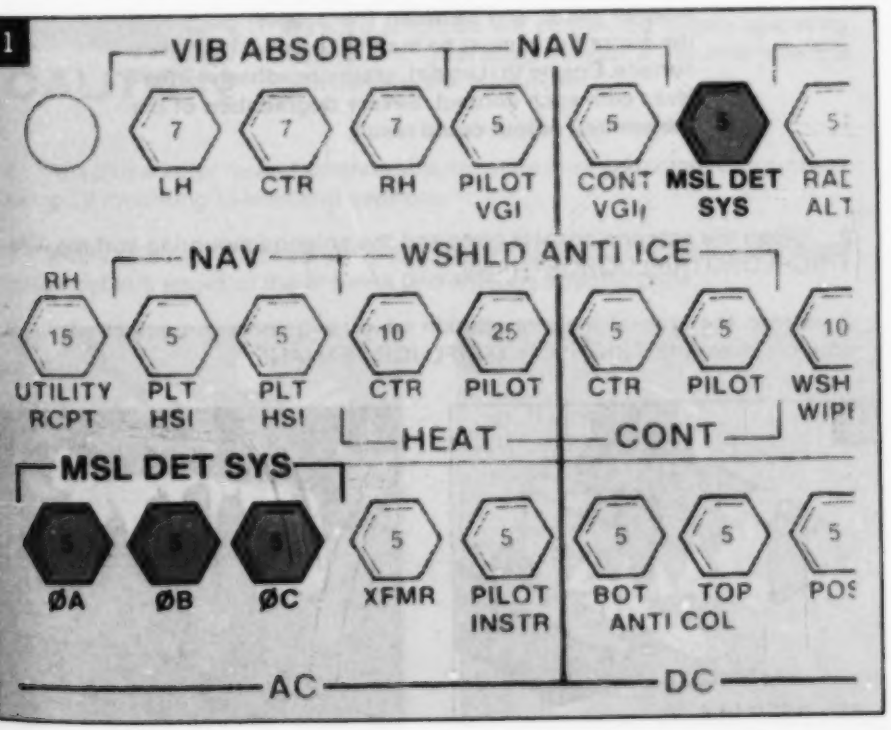
CAUTION

Ensure that the control indicator POWER ON/OFF switch is in the OFF position before installing the antennas. The receiver transmitter may be damaged if the countermeasures set is turned on during installation.

NOTE

The procedure is identical for installing either antenna except that antenna orientation, keyed by the mounting hole position, is 180° out of phase.

1. Ensure that the MSL DET SYS circuit breakers located on the power distribution panel are out (not depressed) removing the 115 V ac, 3-phase, 400 Hz and 28 V dc power to the equipment.



!! WARNING !!

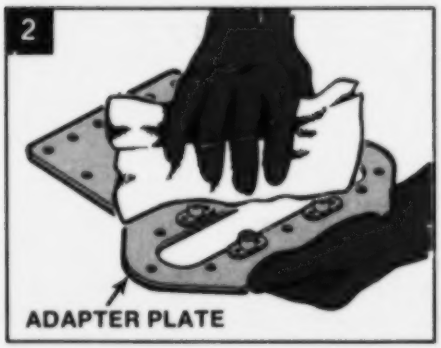
Adequate ventilation should be provided while using TRICHLOROTRIFLUOROETHANE. Prolonged breathing of vapor should be avoided. The solvent should not be used near heat or open flame; the products of decomposition are toxic and irritating. Since TRICHLOROTRIFLUOROETHANE dissolves natural oils, prolonged contact with skin should be avoided. When necessary, use gloves which the solvent cannot penetrate. If the solvent is taken internally, consult a physician immediately.

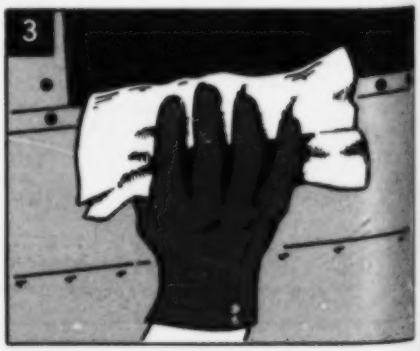
NOTE

Electrical contact between the antenna and the adapter plate, and between the adapter plate and the aircraft skin must be maintained over the entire surface. Ensure that no dirt, grease or adhesive interferes with such contact. Severe degradation of the transmitted output could result.

2. Clean the antenna adapter plate and the antenna mounting surface with TRICHLOROTRIFLUOROETHANE.

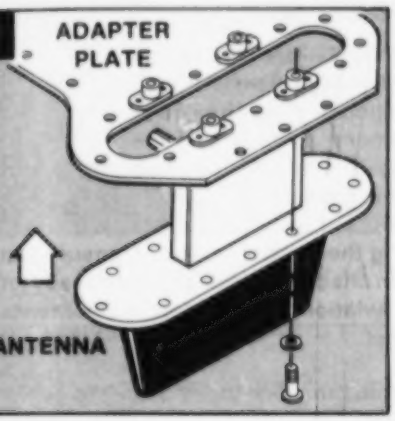
3. Clean the area of the aircraft skin which will come in contact with the adapter plate with TRICHLOROTRIFLUOROETHANE.

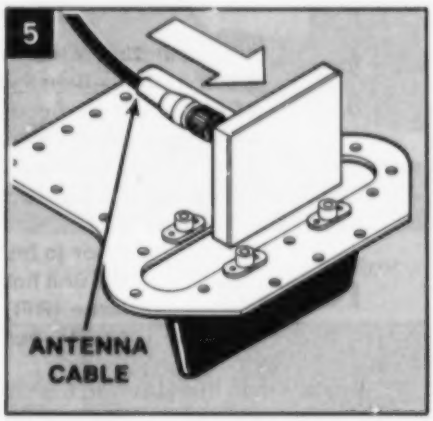




4. Attach the antenna to the antenna adapter plate using 4 mounting screws and washers.

5. Reach into the adapter plate opening on aircraft and pull antenna cable out from aircraft. Attach cable connector to antenna connector, and secure cable clamp to antenna stud.

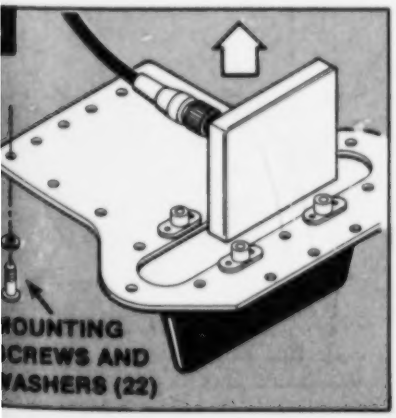


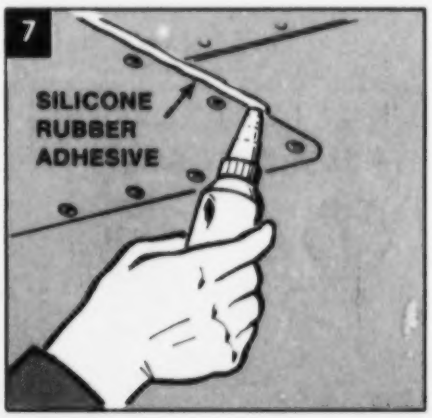


Be sure antennas are connected before operating equipment. Operating without a transmit antenna will damage the transmitter.

6. Attach the antenna and antenna adapter plate to aircraft mounting surface using 22 mounting screws and washers.

7. Apply silicone rubber adhesive to the antenna and aircraft skin around the entire outside edges of the antenna and antenna adapter plate.





Perform the following steps to install the control indicator.

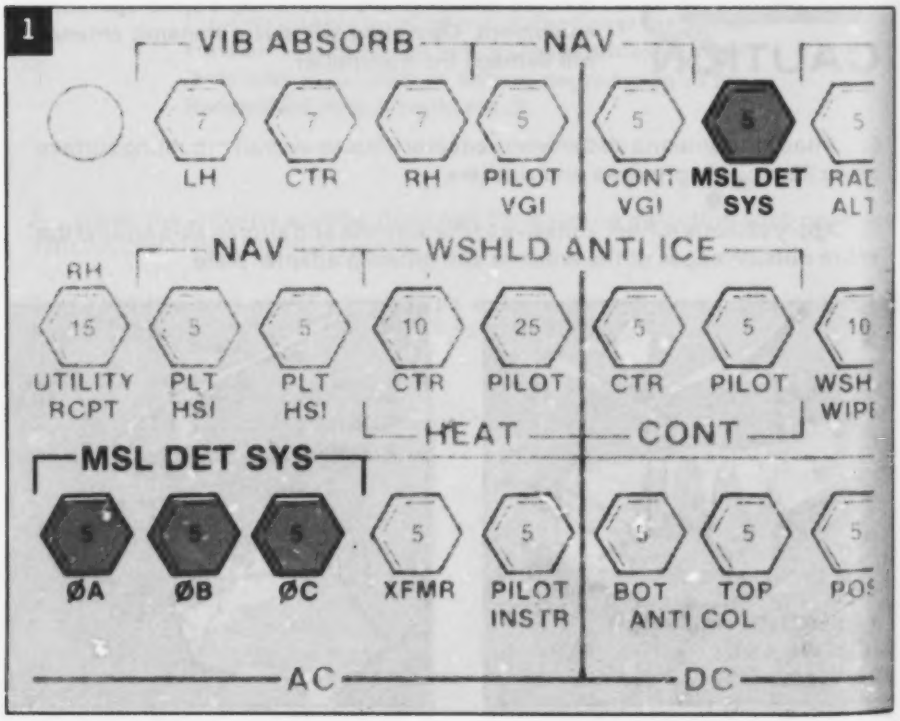
WARNING

When the control indicator POWER ON/OFF switch is in the ON position and the M-130 system is armed, a flare launch can occur creating a serious hazard to nearby personnel or equipment. Be sure that the POWER ON/OFF switch is in the OFF position before installing the control indicator.

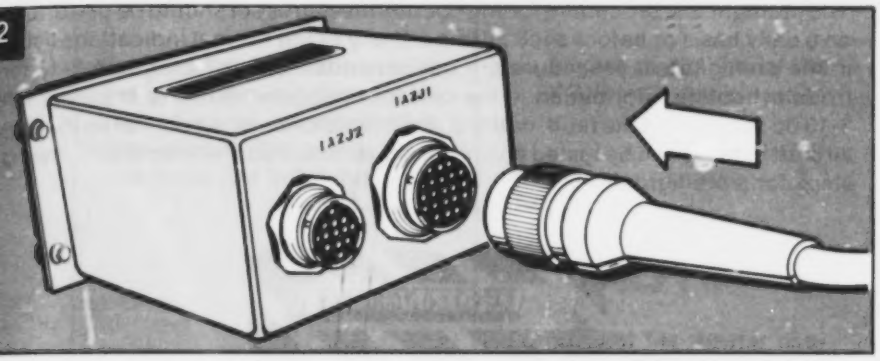
NOTE

Prior to installing the control indicator, ensure that the unit has been checked and designated ready for issue (RFI) by Aviation Intermediate Maintenance (AVIM) personnel.

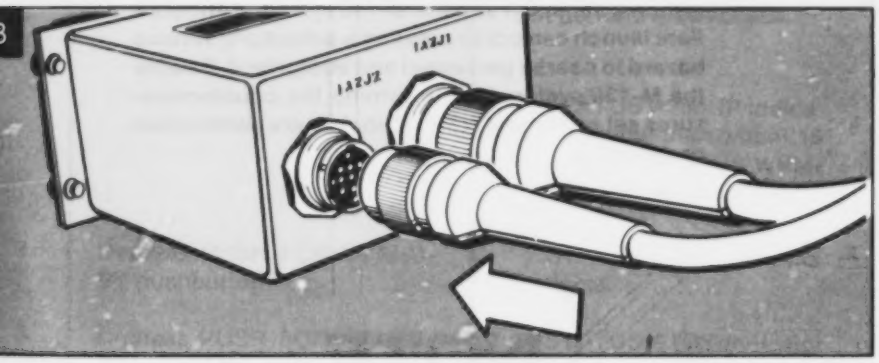
1. Ensure that the MSL DET SYS circuit breakers located on the power distribution panel are out (not depressed) removing the 115 V ac, 3-phase, 400 Hz and 28 V dc power to the equipment.



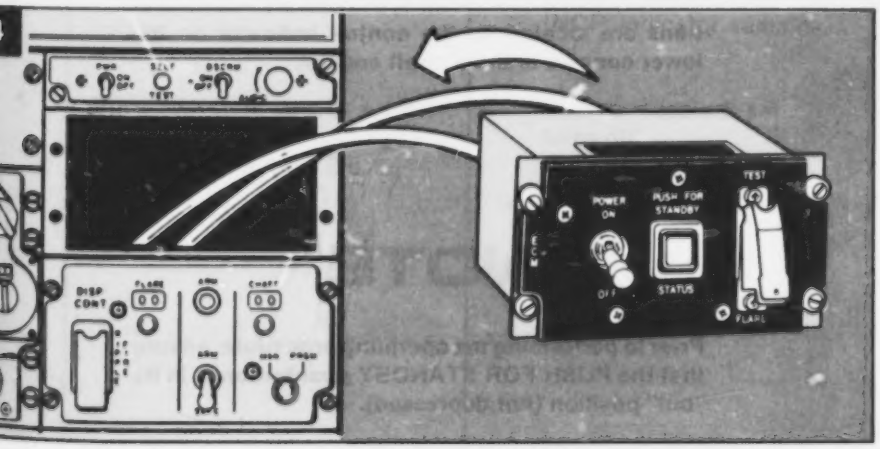
2. Connect the cable from the receiver transmitter to control indicator jack J1.



3. Connect the aircraft power cable and CM set interface cable to control indicator jack J2.



4. Install control indicator in the aircraft cockpit and secure with the four turn-lock fasteners on the front of the control indicator.



3-8. PREFLIGHT TEST

The preflight test procedure for the countermeasures set should be performed on a daily basis or before each mission. If any of the normal indications listed in the preflight test procedure are not obtained, refer to paragraph 3-13 for troubleshooting information. If the corrective actions specified in paragraph 3-13 do not correct the fault, notify aircraft maintenance personnel so that the aircraft cabling can be tested and repaired, as required. Perform the following steps for a preflight test.

When the countermeasures set POWER ON/OFF switch is set to ON and the M-130 system is armed, a flare launch can occur creating a potentially serious hazard to nearby personnel and equipment. Disable the M-130 system before turning the countermeasures set on, except when launches are permissible or desirable.

NOTE

Unless otherwise indicated, all controls and indications are located on the control indicator on the lower console in the aircraft cockpit.

NOTE

Prior to performing the operating procedure, ensure that the PUSH FOR STANDBY pushbutton is in its "out" position (not depressed).

TEP	OPERATOR ACTION	NORMAL INDICATION
1.	Turn on the countermeasures set by performing the turn on procedure of paragraph 2-5, and observe the master caution panel CM INOP indicator.	1. Master caution panel CM INOP indicator is not lit. **NOTE** **Verify that the master caution panel CM JAM indicator does not light and remains lit. If it does, the system cannot perform a self check.** 2. STATUS WRMUP indicator lights; then within 15 minutes, STATUS WRMUP indicator goes out.
2.	Depress PUSH FOR STANDBY pushbutton.	STATUS STBY indicator lights.
3.	Depress PUSH FOR STANDBY pushbutton once again.	1. STATUS STBY indicator goes out. 2. Master caution panel CM INOP indicator remains out.
4.	Turn countermeasures set off by performing the turn off procedure of paragraph 2-6.	Countermeasures set turns off.

SECTION III.

PREVENTIVE MAINTENANCE CHECKS AND SERVICES

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PREVENTIVE MAINTENANCE CHECKS AND SERVICES PROCEDURES	3-16
CLEANING	3-16

3-9. GENERAL

The Preventive Maintenance Checks and Services (PMCS) are an easy way to find and correct faults before they cause serious damage to the countermeasures set.

Before you begin the PMCS procedures, REMEMBER:

1. Always remember the PMCS cautions and warnings.

2. If your countermeasures set fails to operate, record the problem on DA Form 2404 and forward to Aviation Intermediate Maintenance (AVIM) as soon as possible.

3. In addition to performing your PMCS procedures, check all your equipment for scratches, dents, exposed metal surfaces, cleanliness and rust. Make a note of all minor defects discovered during operation and inspection on DA Form 2404. Correct them when operations are over.

If you find a problem or weakness in the countermeasures set which, if you continued to operate, would cause damage or failure, stop operations immediately.

3-10. PMCS PROCEDURES

These procedures assume that the countermeasures set system is properly shut down. Preventive maintenance is done without the power systems energized. Be careful in areas where voltage may exist. If at any point in the procedures you cannot perform an operation, do not proceed to the next step until the problem has been corrected. If you cannot perform the required maintenance or corrective action, notify Aviation Intermediate Maintenance (AVIM) immediately.

Routine maintenance tasks such as cleaning, dusting, checking for frayed or loose cables, covering unused receptacles, storing items not in use, checking for loose nuts and bolts, etc., are not scheduled on a periodic basis and should be accomplished anytime the Aviation Unit Maintenance (AVUM) technician sees that they must be done.

3-11. CLEANING

Cleaning your equipment is one of the most important maintenance functions that you can perform. However it is often overlooked. Proper cleaning is necessary to keep your equipment in A-1 shape and should be part of your daily routine. The following cleaning procedure should be followed:

Remove dust from exterior surfaces with a soft cloth.

Remove dust from receiver transmitter air intake grill using a vacuum cleaner.

Adequate ventilation should be provided while using TRICHLOROTRIFLUOROETHANE. Prolonged breathing of vapor should be avoided. The solvent should not be used near heat or open flame; the products of decomposition are toxic and irritating. Since TRICHLOROTRIFLUOROETHANE dissolves natural oils, prolonged contact with skin should be avoided. When necessary, use gloves which the solvent cannot penetrate. If the solvent is taken internally, consult a physician immediately.

Remove grease or fungus from surfaces using a cloth dampened with TRICHLOROTRIFLUOROETHANE.

Remove dust or dirt from cable connectors with a soft-bristle brush.

SECTION IV.
TROUBLESHOOTING

SECTION CONTENTS

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VSWR FAULT ISOLATION PROCEDURES	3-21

3-12. INTRODUCTION

This section contains the procedure required to determine if a fault exists in the countermeasures set, and if a fault does exist to isolate the fault to a replaceable unit. A fault in the countermeasures set can be determined during operation (para 2-5) and during preflight testing (para 3-8).

Typical fault indications are:

1. Failure of control indicator STATUS WRMUP or STBY indicators to light or go out when required.

2. Failure of the CM INOP indicator on the master caution panel to light.

3. Failure of the VSWR FAULT indicator on the receiver transmitter to light.

4. Failure of the cooling fan on the receiver transmitter to operate.

Other faults can be determined by visual inspection (para 3-10).

3-13. TROUBLESHOOTING PROCEDURES

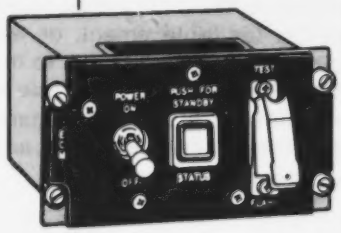
The troubleshooting procedures given in the following table will isolate faults to a unit of the countermeasures set authorized for replacement, or will indicate that a fault exists elsewhere in the aircraft interconnections to the countermeasures set. The step number in the STEP column of the table is keyed to the step number in the STEP column of the preflight test table (para 3-8). The combined use of these tables provides a complete test and troubleshooting procedure of the countermeasures set.

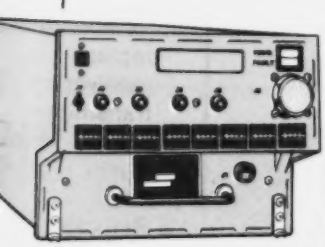
WARNING

When the control indicator POWER ON/OFF switch on the countermeasures set is in the ON position and the M-130 system is armed, a flare launch can occur creating a serious hazard to nearby personnel or equipment. Be sure that the POWER ON/OFF switch is in the OFF position before installing the control indicator.

CAUTION

Whenever observing the receiver transmitter VSWR FAULT indicator, ensure that the countermeasures set is in the standby mode.

STEP	FAULT INDICATION	PROBABLE CAUSE	CORRECTIVE ACTION
1.	1. Master caution panel CM INOP indicator lights.	Aircraft power not supplied to CM set.	Provide aircraft power to CM set.
	2. STATUS WRMUP indicator does not light.	1. Failed STATUS WRMUP indicator lamps.	1. Remove and replace STATUS WRMUP indicator lamps (para 3-21).
		2. Failed control indicator.	2. Remove and replace control indicator (para 3-19 and 3-20).

STEP	FAULT INDICATION	PROBABLE CAUSE	CORRECTIVE ACTION
		3. Failed receiver transmitter.	3. Remove and replace receiver transmitter (para 3-15 and 3-16).
	3. STATUS WRMUP indicator does not go out within 15 minutes.	1. Failed control indicator.	1. Remove and replace control indicator (para 3-19 and 3-20).
		2. Failed receiver transmitter.	2. Remove and replace receiver transmitter (para 3-15 and 3-16).
2.	STATUS STBY indicator does not light.	1. Failed STATUS STBY lamps.	1. Remove and replace STATUS STBY lamps (para 3-21).
		2. Failed control indicator.	2. Remove and replace control indicator (para 3-19 and 3-20).
		3. Failed receiver transmitter.	3. Remove and replace receiver transmitter (para 3-15 and 3-16).
	1. STATUS STBY indicator does not go out.	Failed control indicator.	Remove and replace control indicator (para 3-19 and 3-20).

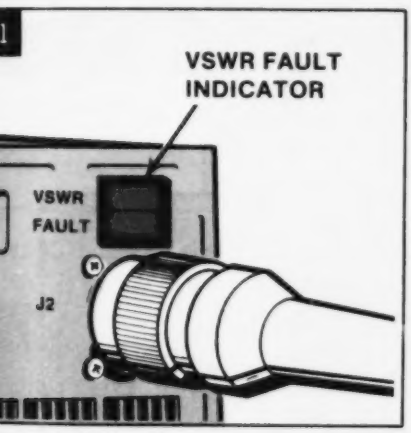
STEP	FAULT INDICATION	PROBABLE CAUSE	CORRECTIVE ACTION
	2. Master caution panel CM INOP indicator lights and VSWR FAULT J3 lamp lights.	1. Failure in J3 antenna circuit or cabling.	1. Proceed to para 3-14.
		2. Failed receiver transmitter.	2. Remove and replace receiver transmitter (para 3-15 and 3-16).
		3. Faulty antenna.	3. Remove and replace antenna (para 3-17 and 3-18).
	3. Master caution panel CM INOP indicator lights and VSWR FAULT J4 lamp lights.	1. Failure in J4 antenna circuit or cabling.	1. Proceed to para 3-14.
		2. Failed receiver transmitter.	2. Remove and replace receiver transmitter (para 3-15 and 3-16).
		3. Faulty antenna.	3. Remove and replace antenna (para 3-17 and 3-18).

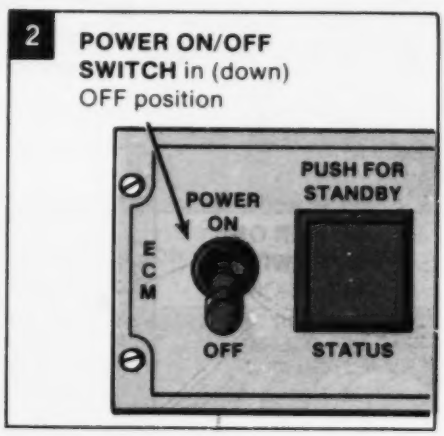
3-14. VSWR FAULT ISOLATION PROCEDURES

If the receiver transmitter VSWR FAULT J3 or J4 indicator lights, perform the following steps to determine where the failure has occurred.

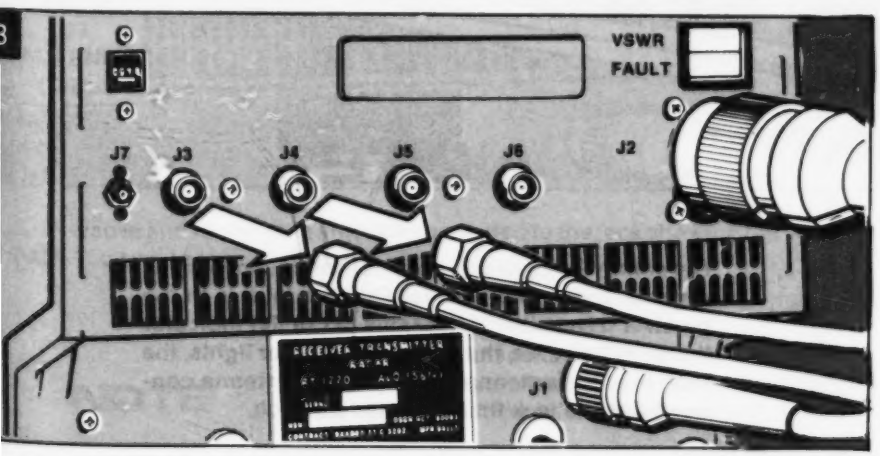
NOTE **Unless otherwise indicated, all controls and indicators are located on the control indicator.**

1. Note which receiver transmitter VSWR FAULT indicator (J3 or J4) is lit.
2. Set POWER ON/OFF to OFF.

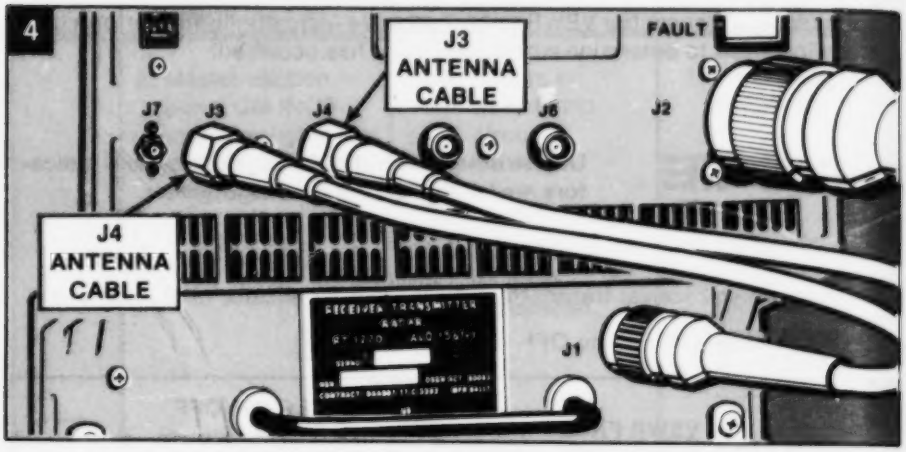




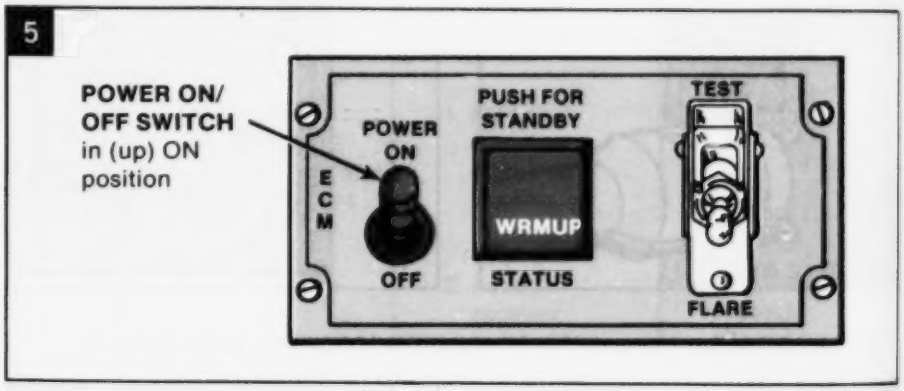
3. Disconnect antenna cables from receiver transmitter jacks J3 and J4.



4. Reconnect J4 antenna cable to J3 and J3 antenna cable to J4.



5. Set POWER ON/OFF switch to ON.

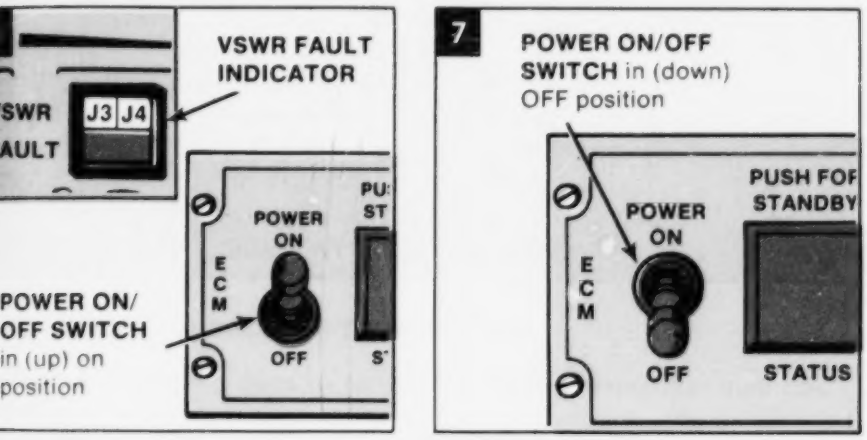


NOTE

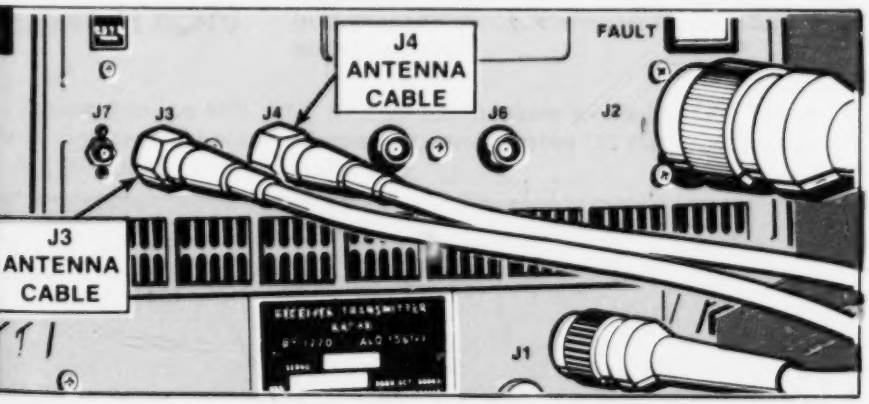
Reversing the J3 and J4 external connections at the receiver transmitter verifies that the fault is in the receiver transmitter if the same (J3 or J4) indicator lights; if, however, the opposite indicator lights, the fault is in the antenna cabling or the antenna connected to the jack that indicated the fault.

6. After STATUS WRMUP lamp goes out observe receiver transmitter VSWR FAULT indicator. If the same indicator is lit as noted in step 1, set POWER ON/OFF switch to OFF and remove and replace the receiver transmitter (para 3-15 and 3-16). If the opposite indicator lights, proceed to step 7.

7. Set POWER ON/OFF switch to OFF.



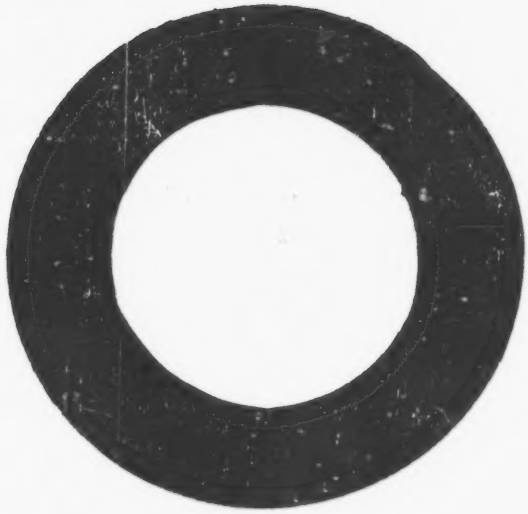
8. Disconnect antenna cables from receiver transmitter jacks J3 and J4, and reconnect them to their original jacks.



9. Remove and replace the antenna connected to the jack showing the VSWR FAULT, J3 or J4 (para 3-17 and 3-18.)

NOTE

If the receiver transmitter VSWR FAULT indicator (J3 or J4) is still lit, the fault is in the antenna cabling. Notify the aircraft maintenance personnel of the fault.



SECTION V.
MAINTENANCE PROCEDURES

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REPLACEMENT OF ANTENNAS	3-33
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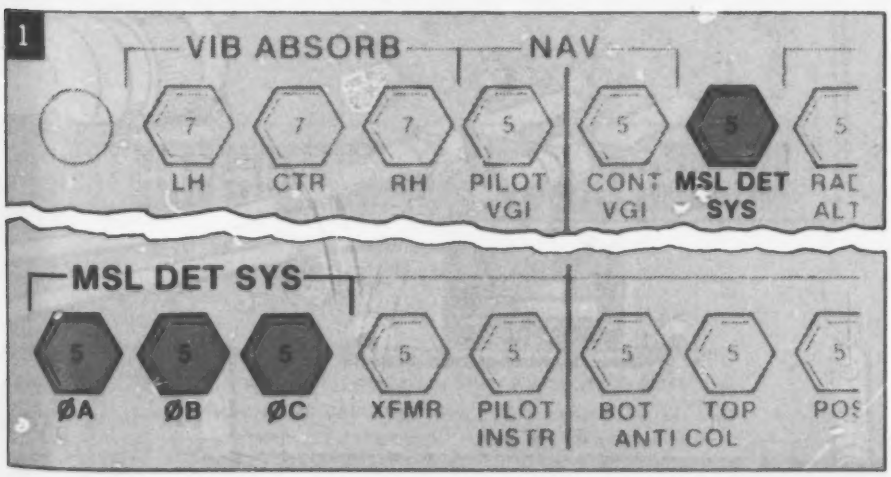
3-15. REMOVAL OF RECEIVER TRANSMITTER

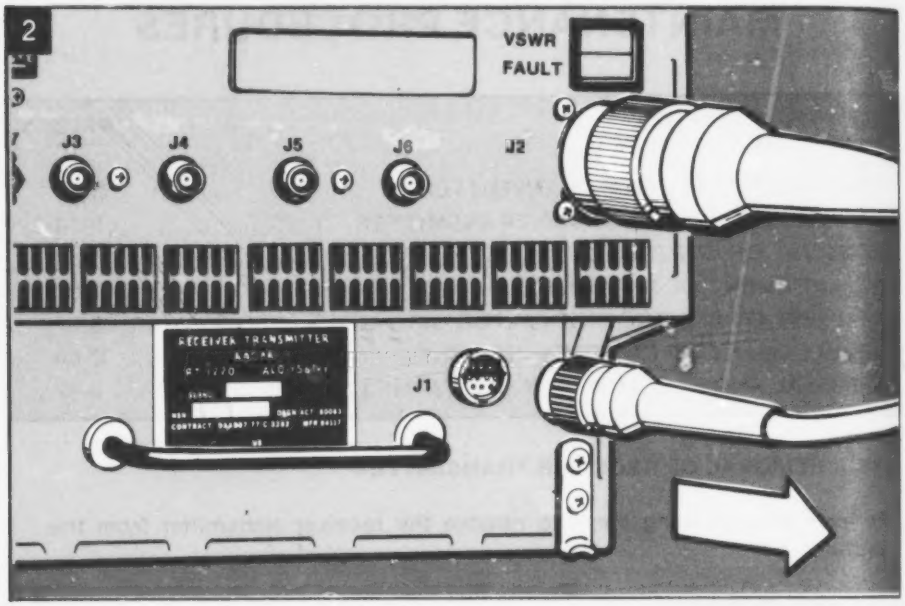
Perform the following steps to remove the receiver transmitter from the aircraft.

Ensure that the control indicator POWER ON/OFF switch is in the OFF position before removing the receiver transmitter. The receiver transmitter may be damaged if the countermeasures set is turned on during removal.

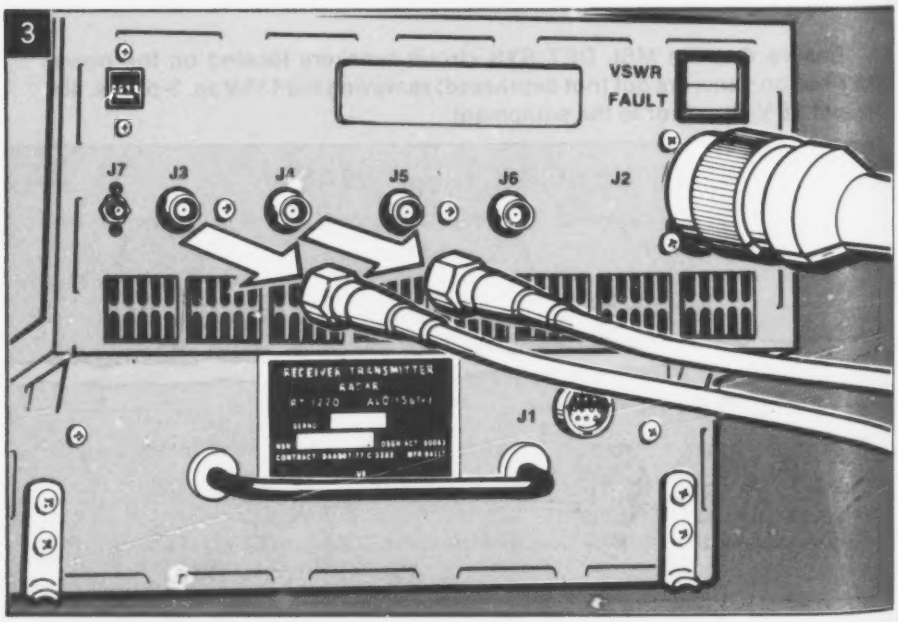
1. Ensure that the MSL DET SYS circuit breakers located on the power distribution panel are out (not depressed) removing the 115 V ac, 3-phase, 400 Hz and 28 V dc power to the equipment.



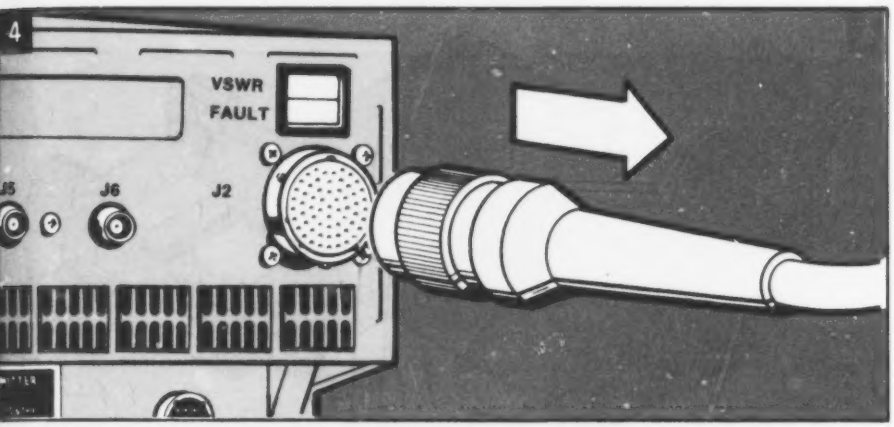
2. Disconnect aircraft power cable from receiver transmitter connector J1.



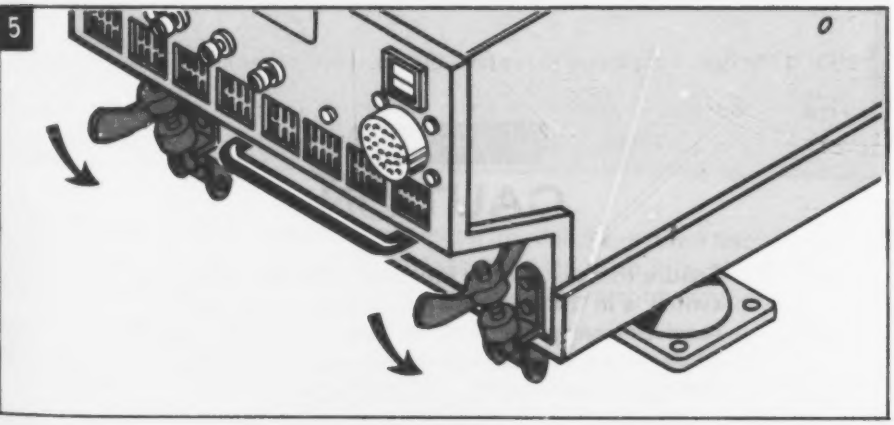
3. Disconnect antenna cables from receiver transmitter connectors J3 and J4.



4. Disconnect control indicator interconnect cable from receiver transmitter connector J2.

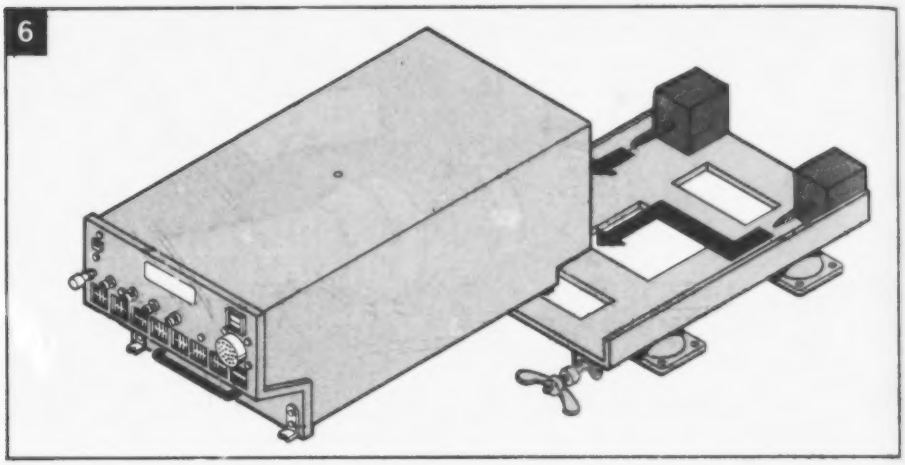


5. Loosen two locking fasteners securing receiver transmitter to shock mount fixture; push fasteners down.



A minimum of two persons must be used in handling or lifting anything in excess of 40 pounds. Extreme care must be used in handling to prevent injury to the individual or damage to the equipment.

6. Pull receiver transmitter from its shock-mounted rack and remove from aircraft.



3-16. REPLACEMENT OF RECEIVER TRANSMITTER

Perform the following steps to replace the receiver transmitter.

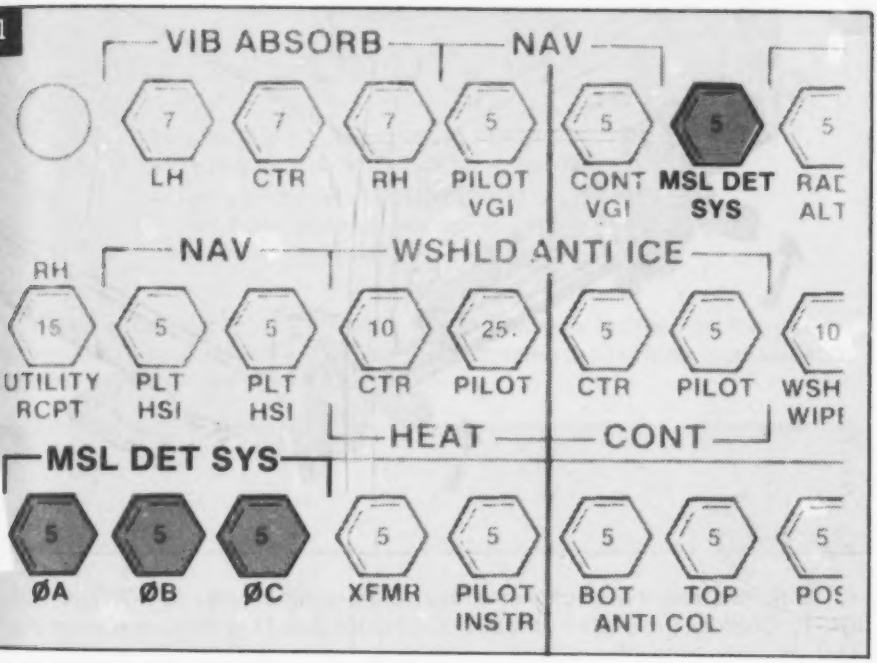
CAUTION

Ensure that the control indicator POWER ON/OFF switch is in the OFF position before replacing the receiver transmitter. The receiver transmitter may be damaged if the countermeasures set is turned on during replacement.

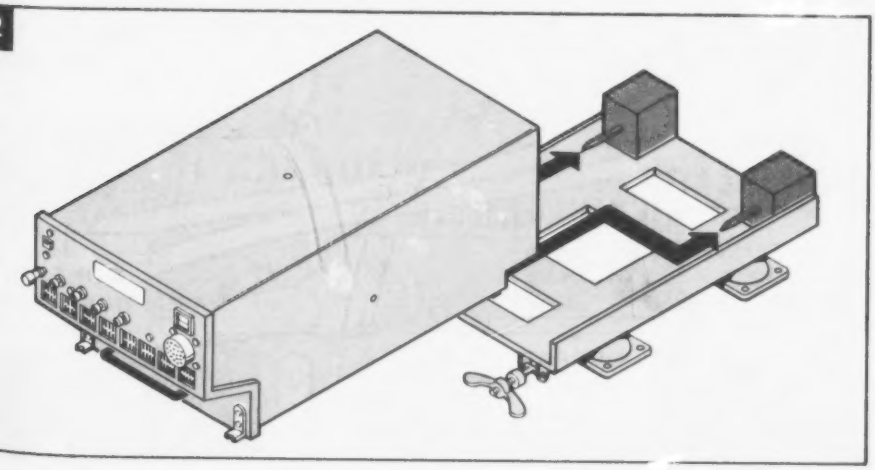
NOTE

Prior to replacement of the receiver transmitter, ensure that the unit has been checked and is designated ready for issue (RFI) by Aviation Intermediate Maintenance (AVIM) personnel.

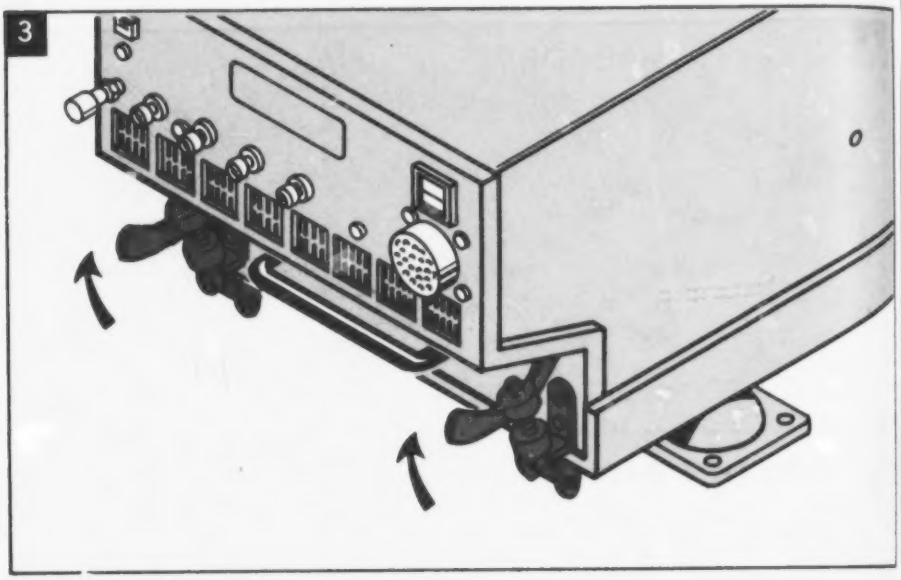
. Ensure that the MSL DET SYS circuit breakers located on the power distribution panel are out (not depressed) removing the 115 V ac, 3-phase, 400 Hz and 28 V dc power to the equipment.



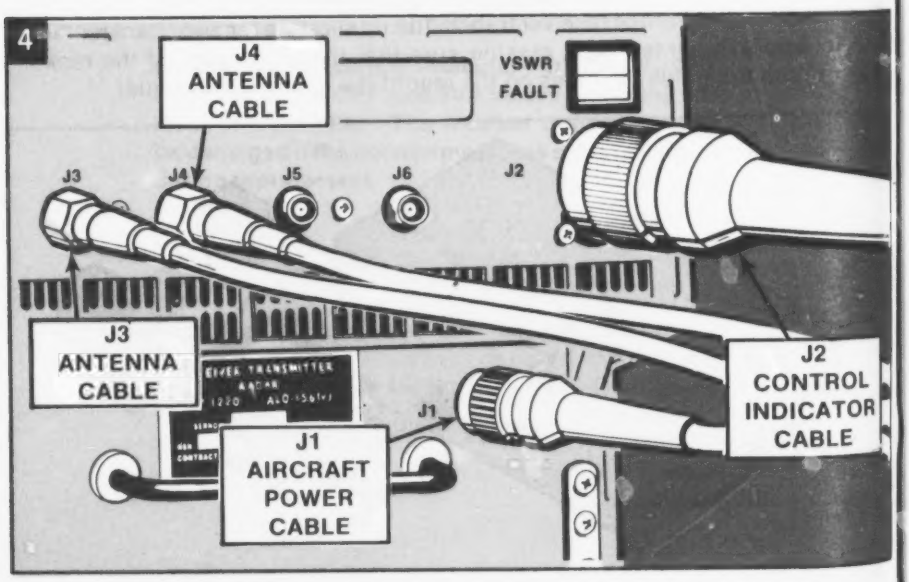
. While holding front of receiver transmitter up slide the receiver transmitter nto its shock-mounted rack, making sure that the guide pins of the rack ngage with the guide pin holes on the rear of the receiver transmitter.



3. Lift the two locking fasteners, and engage them over the clamp-down brackets on the front of the receiver transmitter. Tighten the fasteners securely and install safety wire on each fastener.



4. Connect the antenna cables to receiver transmitter jacks J3 (FWD) and J4 (AFT). Connect the cable from control indicator jack J1 to receiver transmitter jack J2 and connect the aircraft power cable to receiver transmitter jack J1.

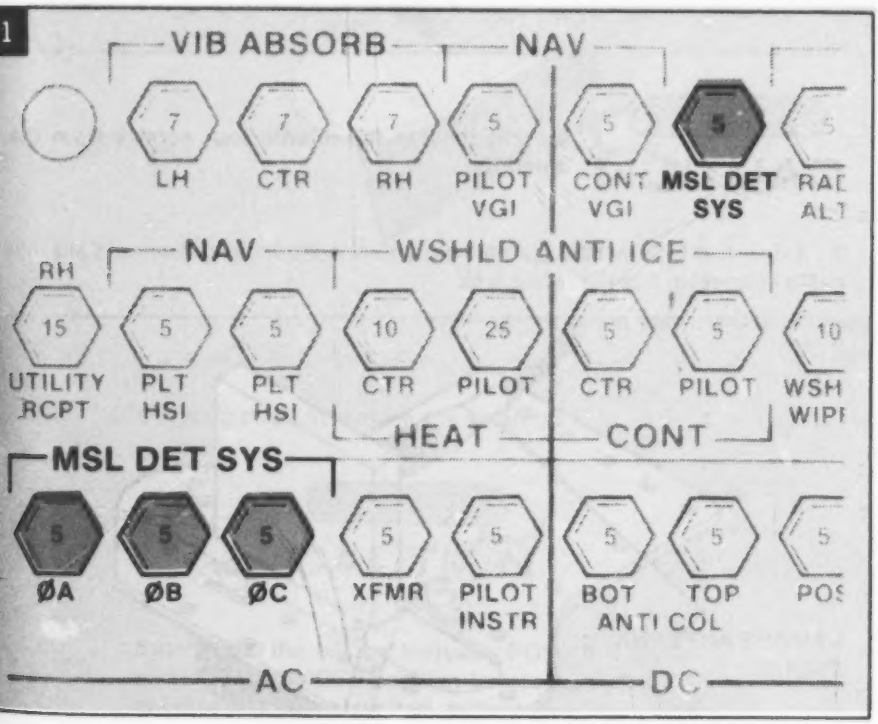


3-17. REMOVAL OF ANTENNAS

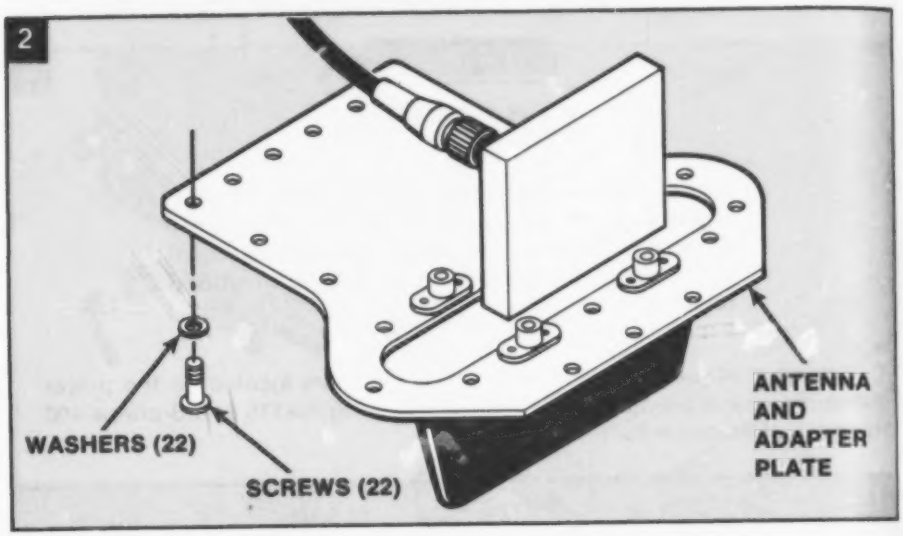
Perform the following steps to remove either antenna from the aircraft.

Ensure that the control indicator POWER ON/OFF switch is in the OFF position before removing the antennas. The receiver transmitter may be damaged if the countermeasures set is turned on during removal of antennas.

1. Ensure that the MSL DET SYS circuit breakers located on the power distribution panel are out (not depressed) removing the 115 V ac, 3-phase, 400 Hz and 28 V dc power to the equipment.

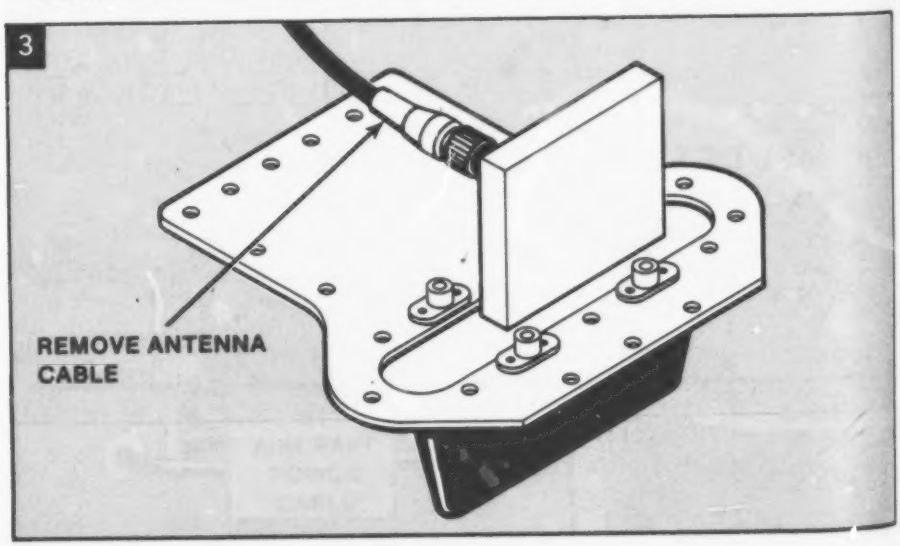


2. Remove 22 mounting screws and washers securing the antenna and antenna adapter plate to aircraft mounting surface and lower from aircraft.

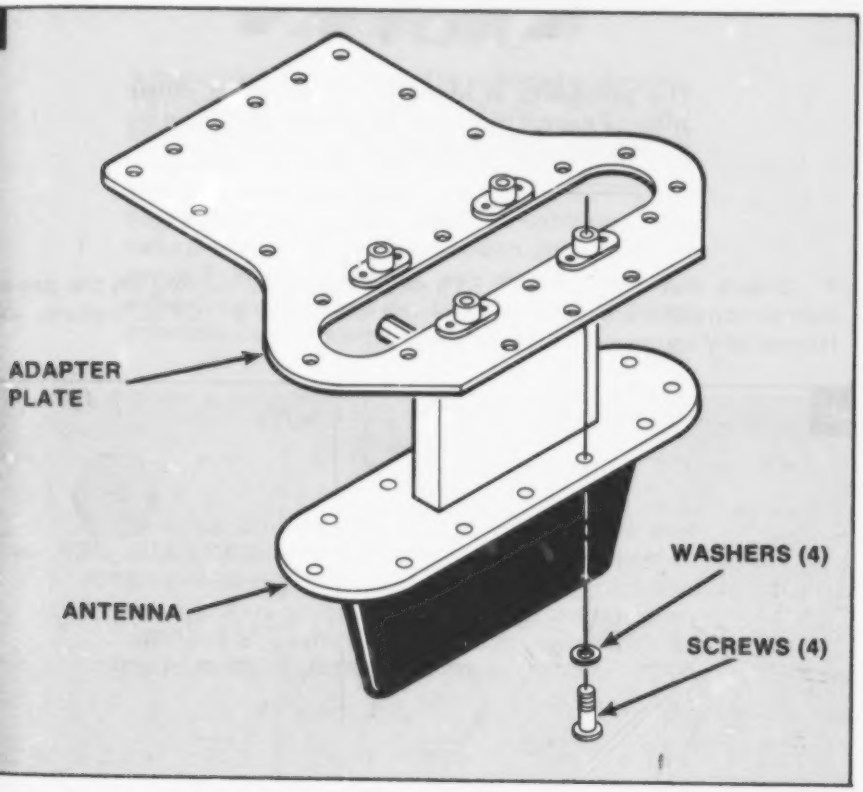


Do not remove the middle four screws from the antenna.

3. Loosen antenna cable clamp from antenna stud and disconnect antenna cable connector from antenna jack.



4. Remove 4 mounting screws and washers securing the antenna to the antenna adapter plate.



-18. REPLACEMENT OF ANTENNAS

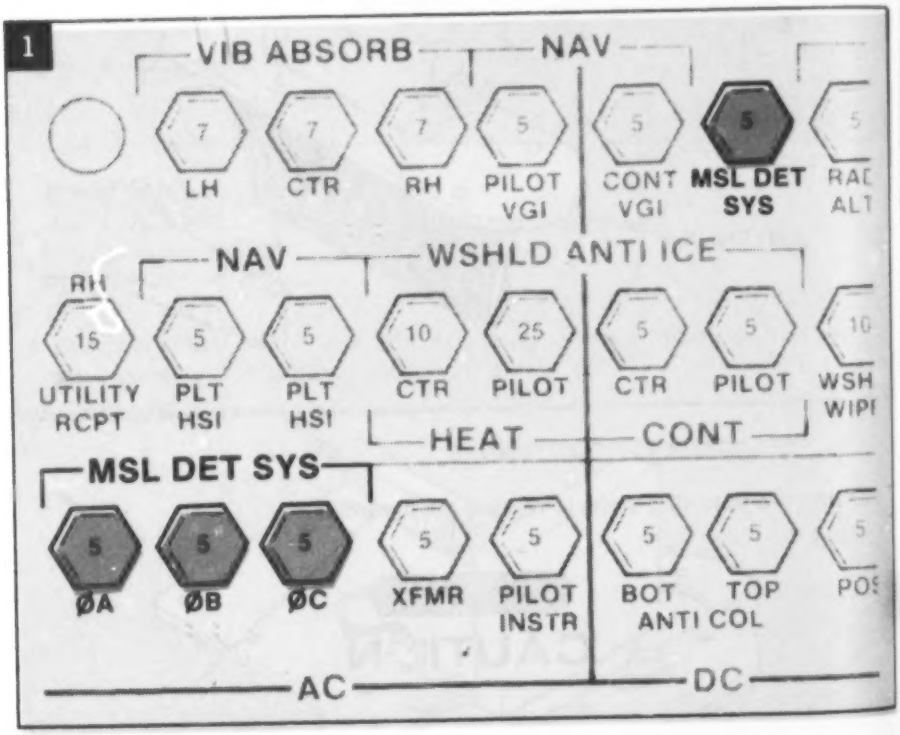
erform the following steps to replace the antennas.

Ensure that the control indicator POWER ON/OFF switch is in the OFF position before replacing the antennas. The receiver transmitter may be damaged if the countermeasures set is turned on during replacement of the antennas.

NOTE

The procedure is identical for replacing either antenna except that antenna orientation, keyed by the mounting hole position, is 180° out of phase.

1. Ensure that the MSL DET SYS circuit breakers located on the power distribution panel are out (not depressed) removing the 115 V ac, 3-phase, 400 Hz and 28 V dc power to the equipment.



!! WARNING !!

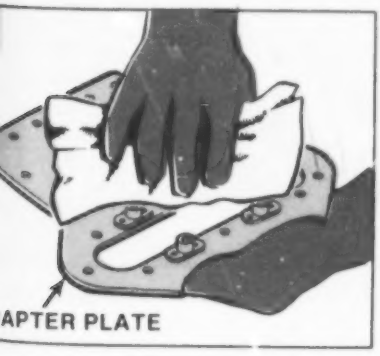
Adequate ventilation should be provided while using TRICHLOROTRIFLUOROETHANE. Prolonged breathing of vapor should be avoided. The solvent should not be used near heat or open flame; the products of decomposition are toxic and irritating. Since TRICHLOROTRIFLUOROETHANE dissolves natural oils, prolonged contact with skin should be avoided. When necessary, use gloves which the solvent cannot penetrate. If the solvent is taken internally consult a physician immediately.

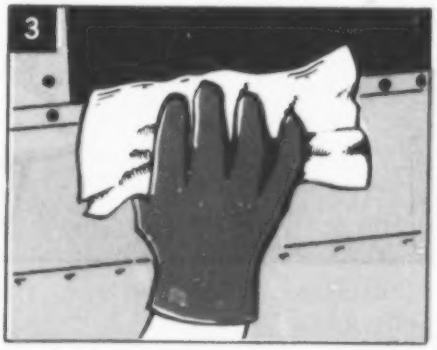
NOTE

Electrical contact between the antenna and the adapter plate, and between the adapter plate and the aircraft skin must be maintained over the entire surface. Ensure that no dirt, grease or adhesive interferes with such contact. Severe degradation of the transmitted output could result.

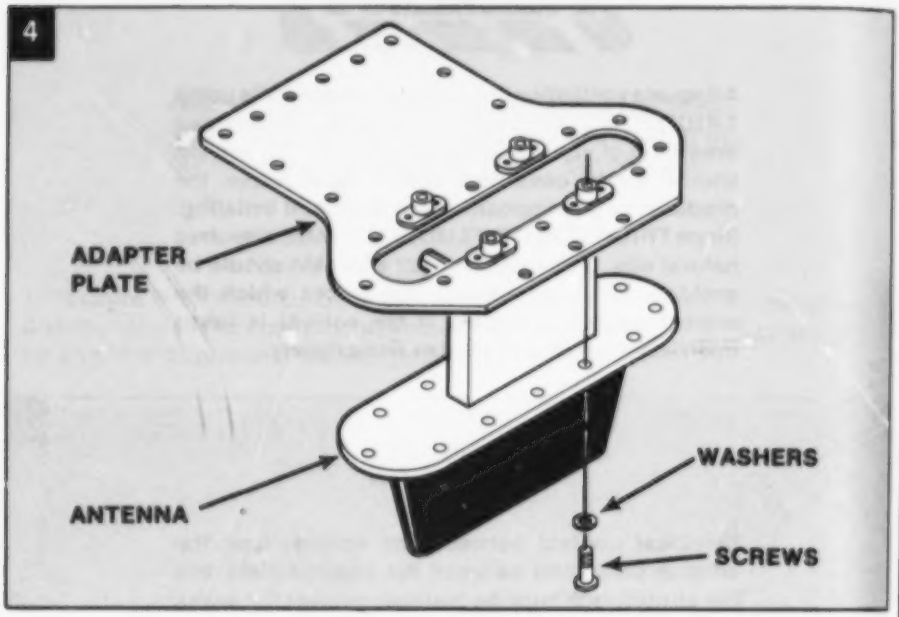
Clean the antenna adapter plate and the antenna mounting surface with RICHLOROTRIFLUOROETHANE.

Clean the area of the aircraft skin which will come in contact with the dapter plate with TRICHLOROTRIFLUOROETHANE.

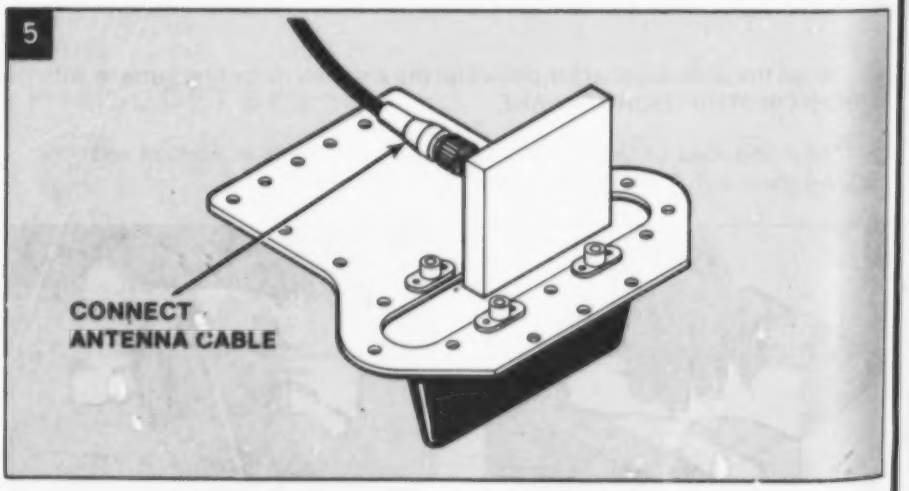




4. Attach the antenna to the antenna adapter plate using 4 mounting screws and washers.



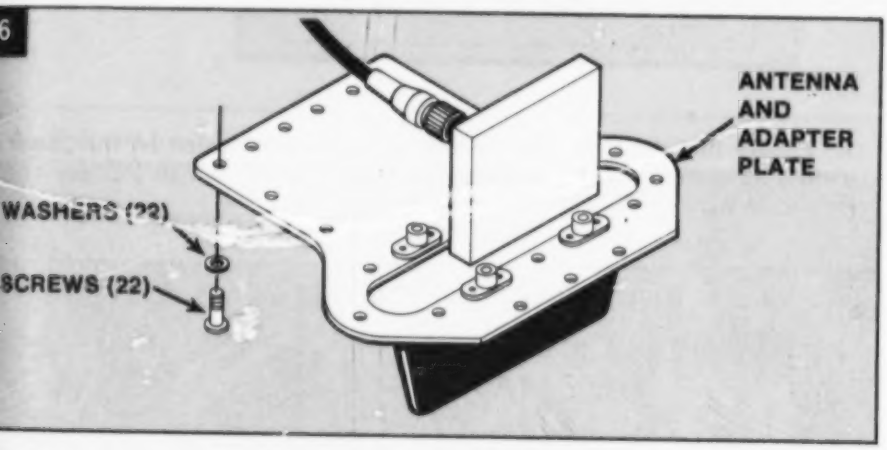
5. Reach into the adapter plate opening and pull antenna cable out from aircraft. Attach cable connector to antenna connector, and secure cable clamp to antenna stud.



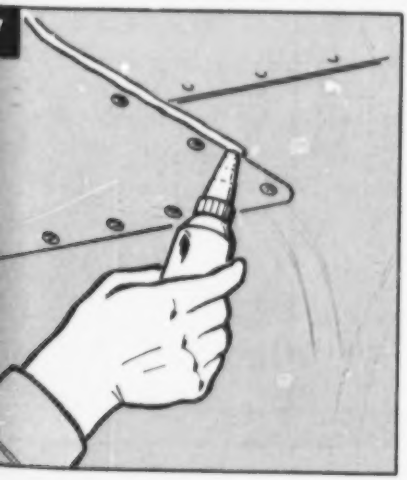
CAUTION

Be sure antennas are connected before operating equipment. Operation without a transmit antenna will damage the transmitter.

6. Attach the antenna and antenna adapter plate to aircraft mounting surface using 22 mounting screws and washers.



7. Apply silicone adhesive to the antenna and aircraft skin around the entire outside edges of the antenna and antenna adapter plate.



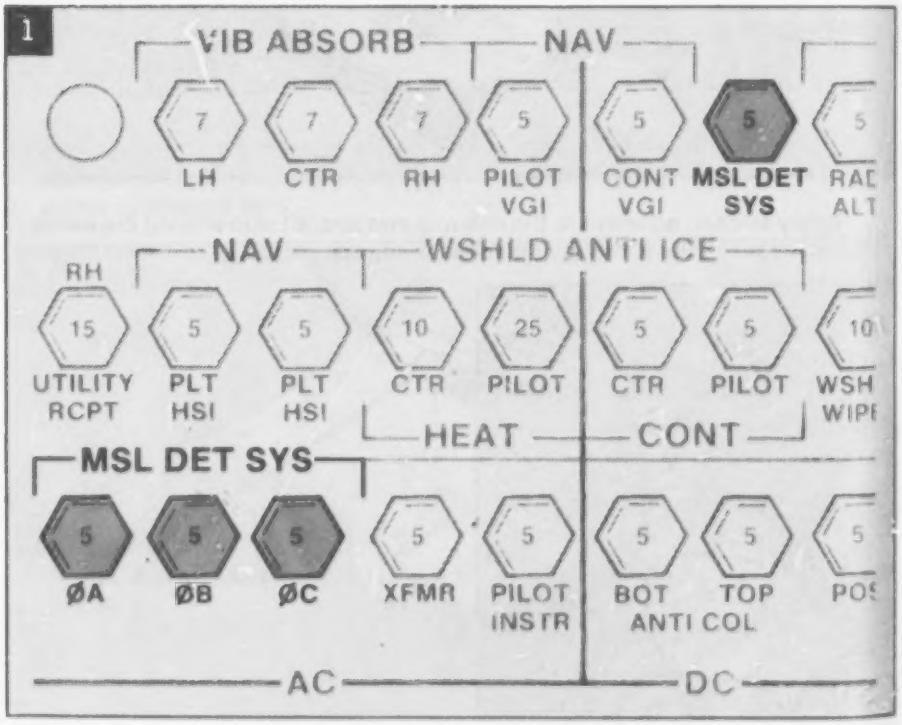
3-19. REMOVAL OF CONTROL INDICATOR

Perform the following steps to remove control indicator from the aircraft.

NOTE

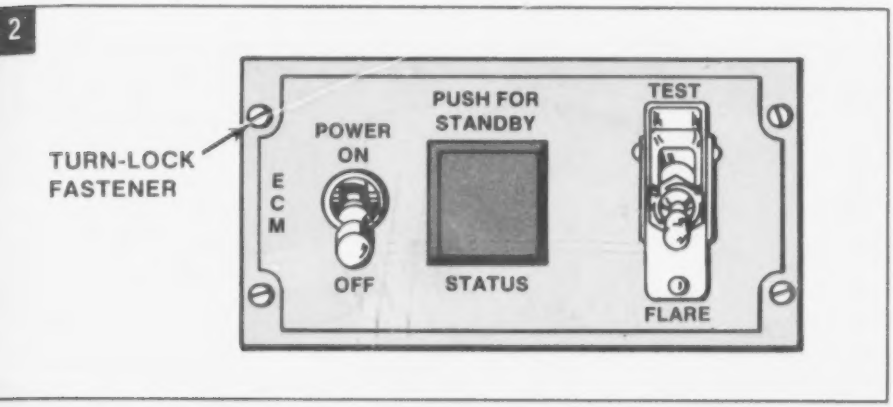
Control indicator is located on lower console in aircraft cockpit.

1. Ensure that the MSL DET SYS circuit breakers located on the power distribution panel are out (not depressed) removing the 115 V ac, 3-phase, 400 Hz and 28 V dc power to the equipment.



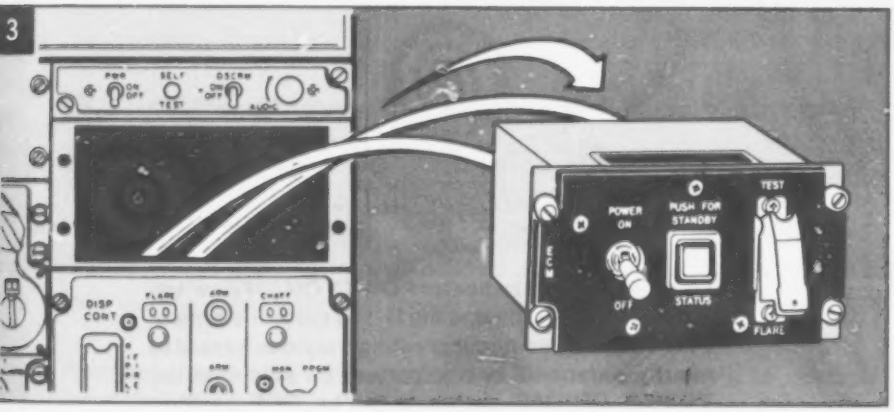
2. Loosen the four turn-lock fasteners on front of control indicator.

2



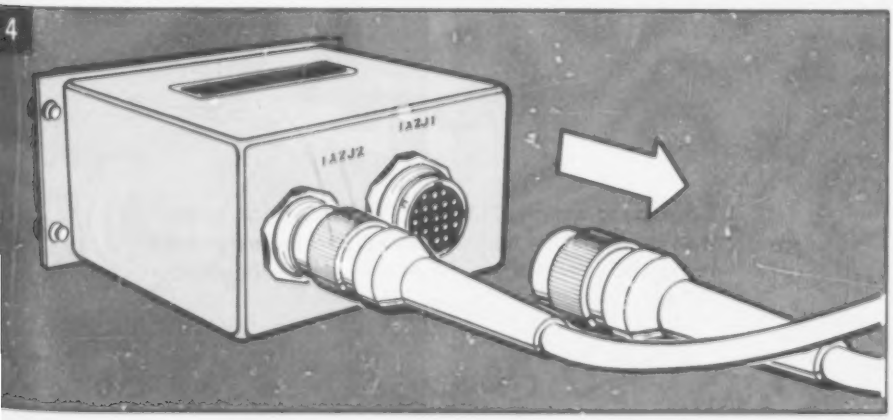
3. Pull unit from console.

3

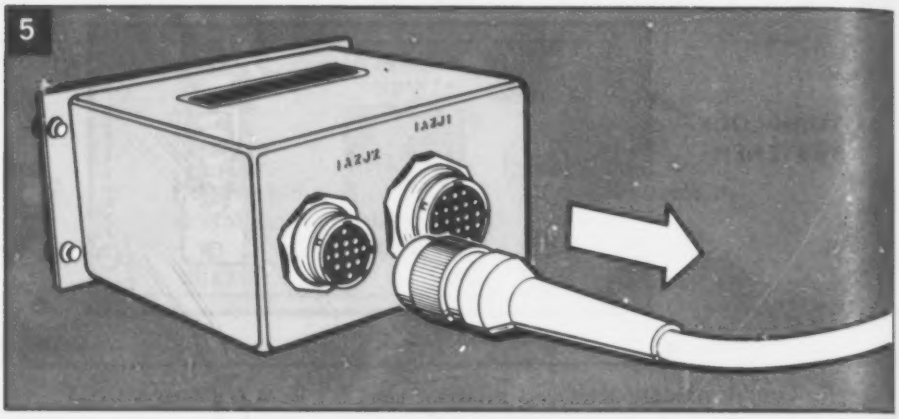


4. Disconnect receiver transmitter interconnect cable from control indicator connector J1.

4



5. Disconnect aircraft power and signal connector from control indicator connector J2 and remove control indicator from aircraft.



Perform the following steps to replace the control indicator.

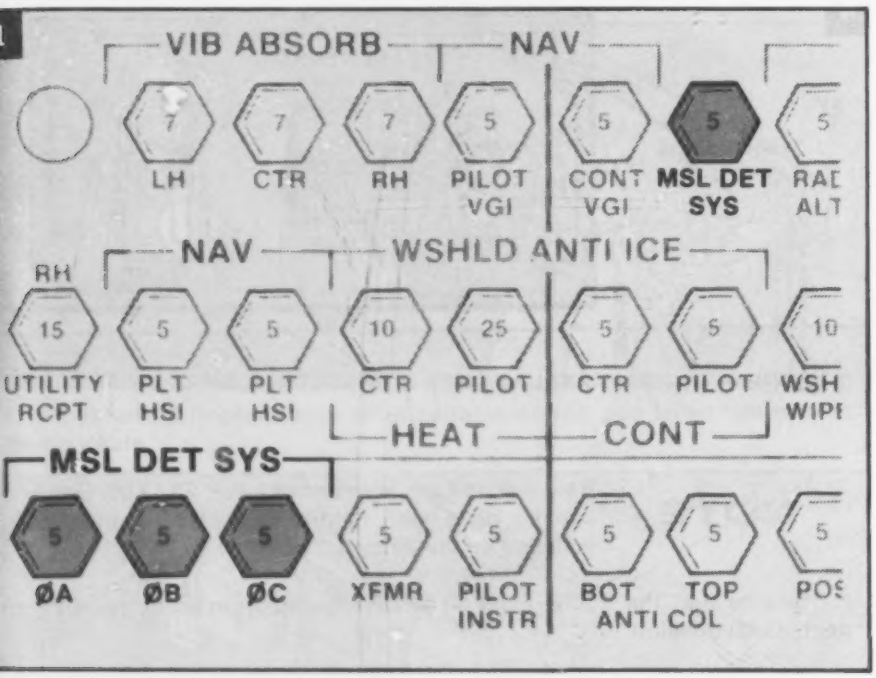
WARNING

When the control indicator POWER ON/OFF switch is in the ON position and the M-130 system is armed, a flare launch can occur creating a serious hazard to nearby personnel or equipment. Be sure that the POWER ON/OFF switch is in the OFF position before replacing the control indicator.

NOTE

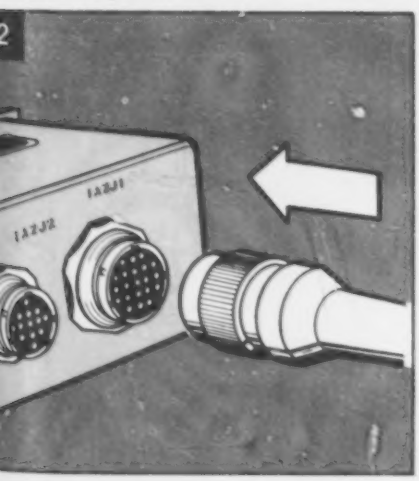
Prior to replacement of the control indicator, ensure that the unit has been checked and is designated ready for issue (RFI) by Aviation Intermediate Maintenance (AVIM) personnel.

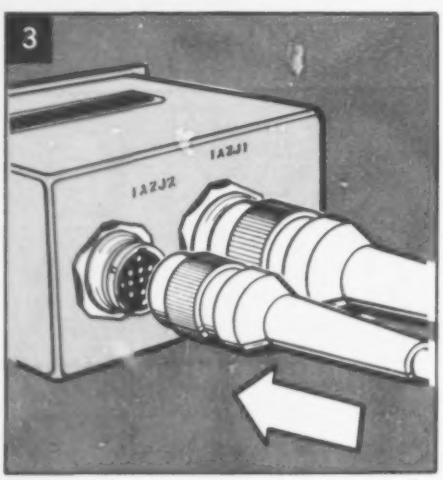
1. Ensure that the MSL DET SYS circuit breakers located on the power distribution panel are out (not depressed) removing the 115 V ac, 3-phase, 400 Hz and 28 V dc power to the equipment.



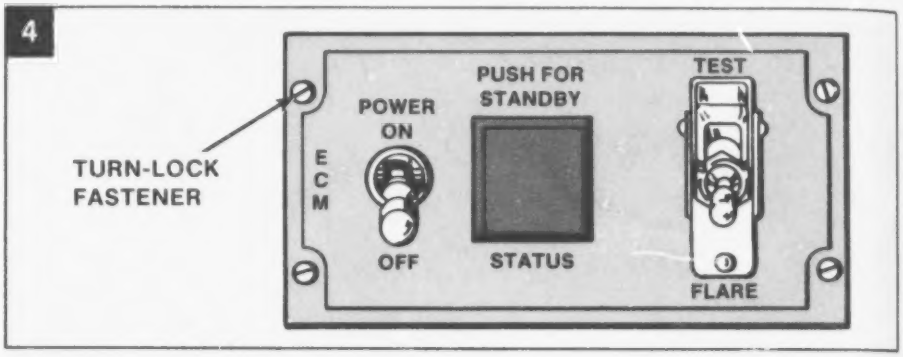
2. Connect the cable from the receiver transmitter to control indicator jack J1.

3. Connect the aircraft power cable and CM interface cable to control indicator jack J2.





4. Install control indicator on the lower console in the aircraft cockpit and secure with the four turn-lock fasteners on the front of the control indicator.

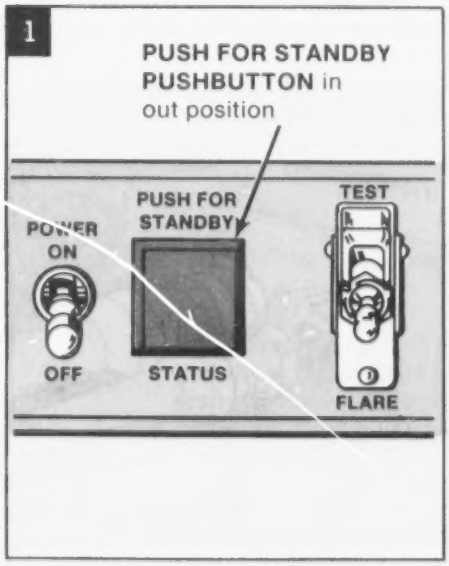


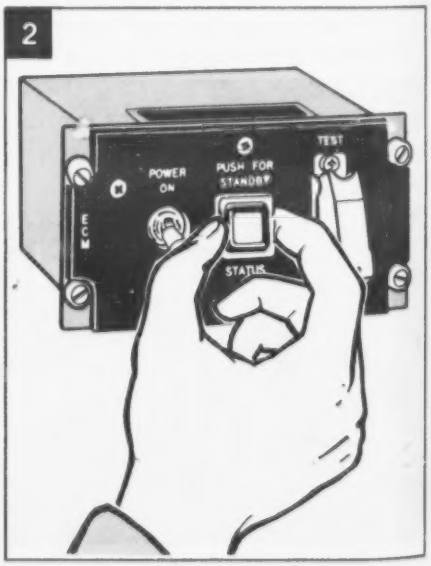
3-21. REMOVAL AND REPLACEMENT OF STATUS LAMPS

NOTE **Removal and replacement of failed STATUS lamps can be done with control indicator removed or installed on the aircraft.**

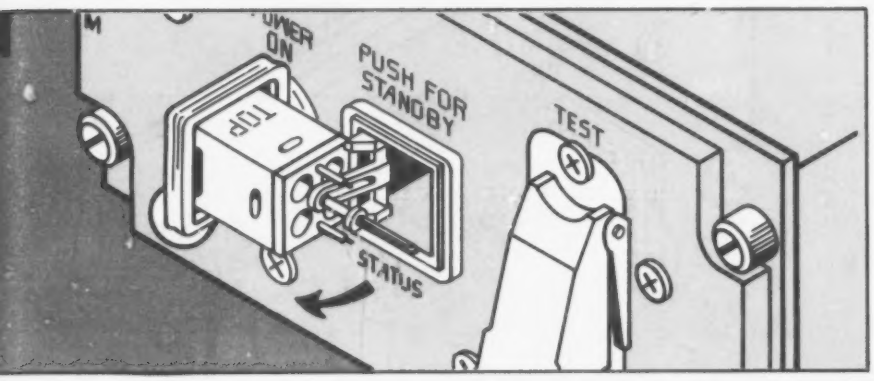
1. Ensure that the PUSH FOR STANDBY pushbutton is in its out (not depressed) position.

2. Pull back outer rubber cover to expose fingernail slots on two opposite sides of indicator assembly.

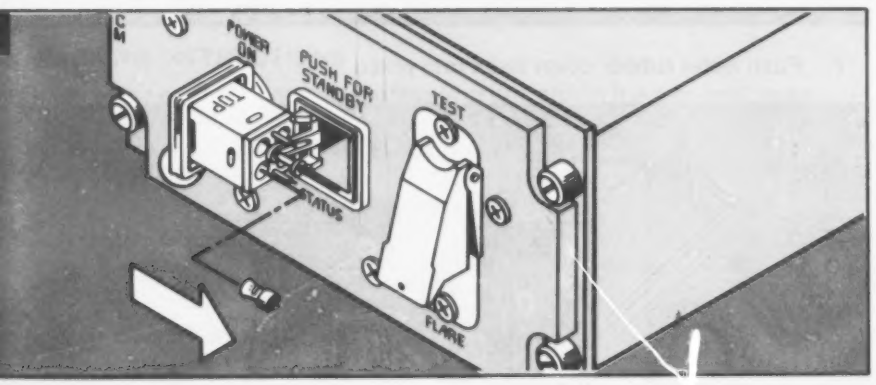




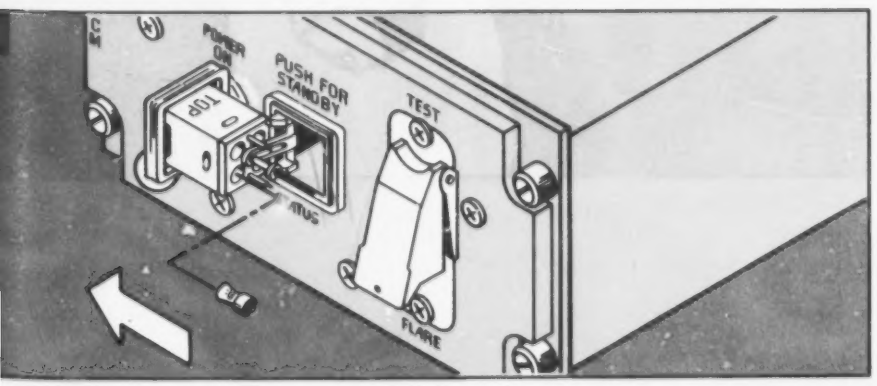
3. Using fingernails or other suitable device, grasp two opposite sides of indicator assembly and partially pull out from case. Gray hinge will rotate so that indicator assembly will hang from side of case.



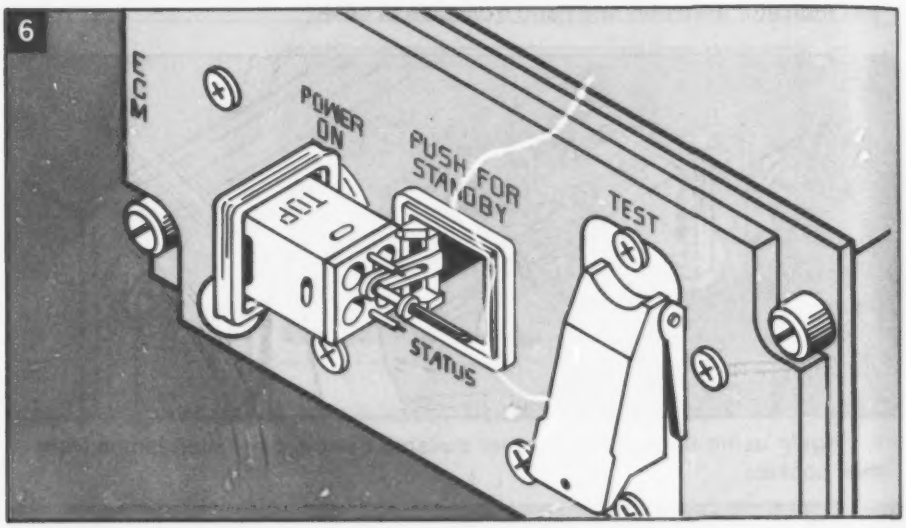
4. Again using fingernails or other suitable device, pull failed lamps from their sockets.



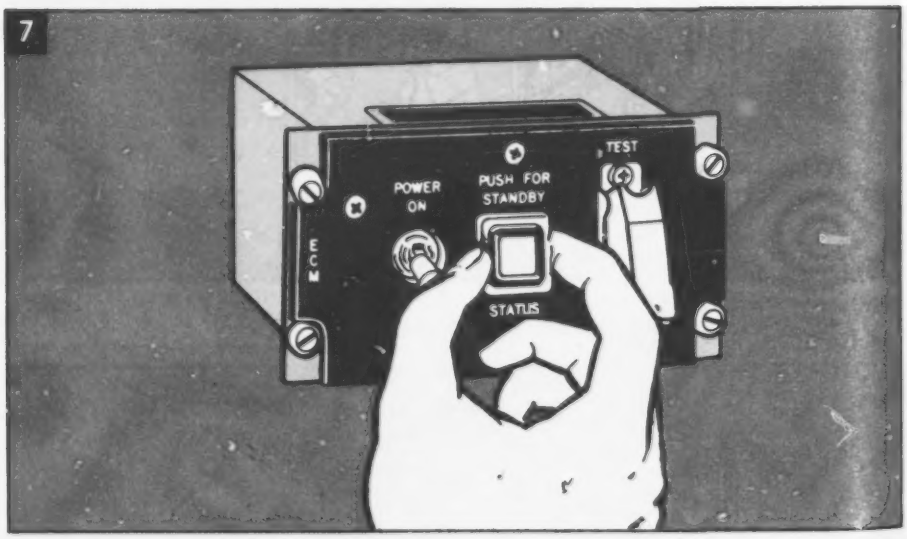
5. Replace removed lamps with new lamps.



6. Note location of top of indicator assembly and push back into case.



7. Push outer rubber cover back into place.



SECTION VI.

PREPARATION FOR STORAGE OR SHIPMENT

ECTION CONTENTS PAGE

ECURITY PROCEDURES 3-45
ACKING INSTRUCTIONS 3-45
DMINISTRATIVE STORAGE PROCEDURE 3-45
NTERMEDIATE AND LONG TERM STORAGE 3-45

22. SECURITY PROCEDURES

ne receiver transmitter, RT-1220/ALQ-156(V), is classified CONFIDENTIAL. npack and store only in a secure area. Make sure that only personnel having need to know" are allowed access to the receiver transmitter.

23. PACKING INSTRUCTIONS

shipment of the entire countermeasures set or any part of it is required, wrap moisture-proof material and pack in any suitable container with cushioning aterial to prevent the unit from shock damage.

24. ADMINISTRATIVE STORAGE PROCEDURE

hen storage is only for a short term, 1 to 45 days, store the countermeasures t indoors in a safe area where it will be protected from damage or adverse vironmental factors such as water or extreme dust.

25. INTERMEDIATE AND LONG TERM STORAGE

r intermediate storage (46 to 180 days) or long term or flyable storage (180 ys or more), it is recommended that all units of the countermeasures set be ored together. Under these conditions the stored unit will be complete when moved for use.

APPENDIX A
REFERENCES

A-1. PUBLICATION INDEXES

The following indexes should be consulted frequently for latest changes or revisions of references given in this appendix and for new publications relating to material covered in this manual.

Consolidated Index of Army Publications and Blank Forms ..... DA Pam 310-1

A-2. FORMS AND RECORDS

The following forms and records pertain to this material.

Discrepancy in Shipment Report ..... SF 361
Report of Discrepancy ..... SF 364
Quality Deficiency Report ..... SF 368
Recommended Changes to Equipment Technical Publications ..... DA Form 2028-2

A-3. OTHER PUBLICATIONS

The following publications contain information pertinent to this material and associated equipment

DESTRUCTION TO PREVENT ENEMY USE

Procedures for Destruction of Electronics Material to Prevent Enemy Use (Electronics Command) ..... TM 750-244-2

GENERAL

Preservation, Packaging and Packing Material, Supplies and Equipment Used by Army ..... SB 38-100
The Army Maintenance Management System (TAMMS) ..... TM 38-750

MAINTENANCE

Administrative Storage Requirements ..... TM 740-90-1

RELATED PUBLICATIONS

Reporting of Item and Packaging Discrepancies ..... AR 735-11-2

Organizational Maintenance Manual
Electronic Equipment Configuration
Army Model CH-47A
(NSN 1520-00-633-6836), CH-47B
(NSN 1520-00-990-2941) and
CH-47C (NSN 1520-00-871-7308)
Helicopters ..... TM 11-1520-209-20

Aviation Unit Maintenance Manual
Electronic Equipment Configuration
Army Model CH-47D Helicopter
(NSN 1520-01-088-3669) ..... TM 11-1520-240-20

Aviation Unit Maintenance Repair Parts
and Special Tool List for Countermeasures
Set AN/ALQ-156(V)1
(NSN 5865-01-145-5197) ..... TM 11-5865-201-20P

Operator's, Aviation Unit, and
Intermediate Maintenance Manual for
Countermeasures Test Set TS-3609/ALQ-156(V)
(NSN 6625-01-142-3433) ..... TM 11-6625-2883-13

Aviation Unit and Intermediate
Maintenance Repair Parts and
Special Tools List (Including Depot
Maintenance Repair Parts and Special
Tools List for Countermeasures Test
Set TS-3609/ALQ-156(V))
(NSN 6625-01-142-3433) ..... TM 11-6625-2883-23P

APPENDIX B
MAINTENANCE ALLOCATION CHART FOR COUNTERMEASURES SET AN/ALQ-156(V)1

SECTION 1.
INTRODUCTION

-1. MAINTENANCE ALLOCATION CHART

. This Maintenance Allocation Chart (MAC) assigns maintenance functions n accordance with the Three Levels of Maintenance concept for Army viation. These maintenance levels (categories) — Aviation Unit Maintenance AVUM), Aviation Intermediate Maintenance (AVIM), and Depot Maintenance - are depicted on the MAC as:

AVUM, which corresponds to an O Code in the Repair Parts and Special Tools List (RPSTL)

AVIM, which corresponds to an F Code in the Repair Parts and Special Tools List (RPSTL)

DEPOT, which corresponds to a D Code in the Repair Parts and Special Tools List (RPSTL).

The maintenance to be performed below depot and in the field is described follows:

(1) Aviation Unit Maintenance (AVUM) activities will be staffed and uipped to perform high frequency "On-Aircraft" maintenance tasks required retain or return aircraft systems to a serviceable condition. The maintenance pability of the AVUM will be governed by the Maintenance Allocation Chart IAC) and limited by the amount and complexity of ground support uipment (GSE), facilities required, authorized manning strength, and itical skills available. The range and quantity of authorized spare odules/components will be consistent with the mobility requirements ctated by the air mobility concept. (Assignments of maintenance tasks to visional company size aviation units will consider the overall maintenance pability of the division, the requirement to conserve personnel and uipment resources, and air mobility requirements.)

MAINTENANCE ALLOCATION CHART (Continued)

(a) Company Size Aviation Units: Perform those tasks which consist primarily of preventive maintenance and maintenance repair and replacement functions associated with sustaining a high level of aircraft operational readiness. Perform maintenance inspections and servicing to include preflight, daily, intermediate, periodic (or phased), and special inspections as authorized by the MAC or higher headquarters. Identify the cause of equipment/system malfunctions using applicable technical manual troubleshooting instructions, built-in-test equipment (BITE), installed aircraft instruments, or test, measurement, and diagnostic equipment (TMDE). Replace worn or damaged modules/components that do not require complex adjustments or system alinement and which can be removed/installed with available skills, tools, and ground support equipment. Perform operational and continuity checks and make minor repairs to the electrical system. Inspect, service and make operational, capacity, and pressure checks to hydraulic systems. Perform servicing, functional adjustments, and minor repair/ replacement to the flight control, propulsion, power train, and fuel systems. Accomplish air frame repair that does not require extensive disassembly, jigging, or alinement. The manufacture of air frame parts will be limited to those items which can be fabricated with tools and equipment found in current air mobile tool and shop sets. Evacuate unserviceable modules/components and end items beyond the repair capability of AVUM to the supporting AVIM.

(b) Less than Company Size Aviation Units: Aviation elements organic to brigade, group, battalion headquarters, and detachment size units are normally small and have less than ten aircraft assigned. Maintenance tasks performed by these units will be those which can be accomplished by the aircraft crew chief or assigned aircraft repair person and will normally be limited to preventive maintenance, inspections, servicing, spot painting, stop drilling, application of nonstress patches, minor adjustments, module/ component fault diagnosis, and replacement of selected modules/ components. Repair functions will normally be accomplished by the supporting AVIM unit.

(2) Aviation Intermediate Maintenance (AVIM) provides mobile, responsive "One-Stop" maintenance support. (Maintenance functions which are not conducive to sustaining air mobility will be assigned to depot maintenance.) AVIM may perform all maintenance functions authorized to be done at AVUM. Repair of equipment for return to user will emphasize support or operational readiness requirements. Authorized maintenance includes replacement and repair of modules/components and end items which can be accomplished efficiently with available skills, tools, and equipment. AVIM establishes the Direct Exchange (DX) program for AVUM units by repairing selected items for return to stock when such repairs cannot be accomplished at the AVUM level. The AVIM level inspects, troubleshoots, performs diagnostic tests, repairs, adjusts, calibrates, and alines aircraft system modules/components. AVIM units will have capability to determine the serviceability of specified

best copy available

AINTENANCE ALLOCATION CHART (Continued)

dules/components removed prior to the expiration of the Time Between erhaul (TBO) or finite life. Module/component disassembly and repair will pport the DX program and will normally be limited to tasks requiring aning and the replacement of seals, fittings, and items of common rdware. Air frame repair and fabrication of parts will be limited to those intenance tasks which can be performed with available tools and test uipment. Unserviceable reparable modules/components and end items ich are beyond the capability of AVIM to repair will be evacuated to Depot intenance. AVIM will perform aircraft weight and balance inspections and er special inspections which exceed AVUM capability. Provides quick ponse maintenance support, including aircraft recovery and air evacuation, the-job training, and technical assistance through the use of mobile intenance contact teams. Maintains authorized operational readiness float craft. Provides collection and classification services for serviceable/ serviceable material. Operates a cannibalization activity in accordance with 750-50. (The aircraft maintenance company within the maintenance talion of a division will perform AVIM functions consistent with air mobility uirements and conservation of personnel and equipment resources. ditional intermediate maintenance support will be provided by the porting nondivisional AVIM unit.)

. USE OF THE MAINTENANCE ALLOCATION CHART (SECTION II)

The Maintenance Allocation Chart assigns maintenance functions to the vest category of maintenance based on past experience and the following nsiderations:

(1) Skills available.

(2) Work time required.

(3) Tools and test equipment required and/or available.

Only the lowest category of maintenance authorized to perform a intenance function is indicated. If the lowest maintenance category cannot form all tasks of any single maintenance function (e.g., test, repair), then higher maintenance level(s) that can accomplish additional tasks will also indicated.

A maintenance function assigned to a maintenance category will omatically be authorized to be performed at any higher maintenance egory.

A maintenance function that cannot be performed at the assigned category maintenance for any reason may be evacuated to the next higher ntenance category. Higher maintenance categories will perform the ntenance functions of lower maintenance categories when required or cted by the commander that has the authority to direct such tasking.

USE OF THE MAINTENANCE ALLOCATION CHART, SECTION II (Continued)

e. The assignment of maintenance function will not be construed as authorization to carry the related repair parts or spares in stock. Information to requisition or otherwise secure the necessary repair parts will be as specified in the associated Repair Parts and Special Tools List (RPSTL).

f. Normally there will be no deviation from the assigned level of maintenance. In cases of operational necessity, maintenance functions assigned to a maintenance level may, on a one-time basis and at the request of the lower maintenance level, be specifically authorized by the maintenance officer of the level of maintenanbce to which the function is assigned. The special tools, equipment, etc. required by the lower level of maintenance to perform this function will be furnished by the maintenance level to which the function is assigned. This transfer of a maintenance function to a lower maintenance level does not relieve the higher maintenance level of the responsibility for the function. The higher level of maintenance will provide technical supervision and inspection of the function being performed at the lower level.

g. Changes to the Maintenance Allocation Chart wil be based on continuing evaluation and analysis by responsible technical personnel and on reports received from field activities.

B-3. MAINTENANCE FUNCTIONS

Maintenance functions will be limited to and defined as follows:

a. Inspect. To determine the serviceability of an item by comparing its physical, mechanical, and/or electrical characteristics with established standards through examination.

b. Test. To verify serviceability by measuring the mechanical or electrical characteristics of an item and comparing those characteristics with prescribed standards.

c. Service. Operations required periodically to keep an item in proper operating condition, i.e., to clean (includes decontaminate, when required), to preserve, to drain, to paint, or to replenish fuel, lubricants, chemical fluids, or gases.

d. Adjust. To maintain, within prescribed limits, by bringing into proper or exact position, or by setting the operating characteristics to specified parameters.

e. Aline. To adjust specified variable elements of an item to bring about optimum or desired performance.

AINTENANCE FUNCTIONS (Continued)

Calibrate. To determine and cause corrections to be adjusted on truments or test, measuring, and diagnostic equipment used in precision asurement. Consists of comparisons of two instruments, one of which is a tified standard of known accuracy, to detect and adjust any discrepancy in accuracy of the instrument being compared.

Install. The act of emplacing, seating, or fixing into position an item, part, module (component or assembly) in a manner to allow the proper ctioning of an equipment or system.

Replace. The act of substituting a serviceable like type part, subassembly, module (component or assembly) for an unserviceable counterpart.

Repair. The application of maintenance services[1] or other maintenance ions[2] to replace serviceability to an item by correcting specific damage, lt, malfunction, or failure in a part, subassembly, module component or embly), end item, or system.

Overhaul. That maintenance effort (service/action) necessary to restore item to a completely serviceable/operational condition as prescribed by intenance standards in appropriate technical publications (i.e., DMWR). erhaul is normally the highest degree of maintenance performed by the ny. Overhaul does not normally return an item to like new condition.

Rebuild. Consists of those services/actions necessary for the restoration unserviceable equipment to a like new condition in accordance with original nufacturing standards. Rebuild is the highest degree of materiel intenance applied to Army equipment. The rebuild operation includes the of returning to zero those age measurements (hours/miles, etc.) considered classifying Army equipment/components.

. GROUP NUMBER AND COMPONENT/ASSEMBLY (Columns 1 and 2 spectively)

Group Number (Column 1). Column 1 lists group numbers, the purpose vhich is to identify components, assemblies, subassemblies, and modules h the next higher assembly.

---

rvices — inspect, test, service, adjust, aline, calibrate, or replace.
ctions — welding, grinding, riveting, straightening, facing, remachining, or urfacing.

GROUP NUMBER AND COMPONENT/ASSEMBLY, Columns 1 and 2 Respectively (Continued)

b. Component/Assembly (Column 2). Column 2 contains the noun names of components, assemblies, subassemblies, and modules for which maintenance is authorized.

B-5 MAINTENANCE FUNCTION (Column 3)

Column 3 lists the functions to be performed o the items listed in column 2.

B-6. MAINTENANCE CATEGORIES AND WORK TIMES (Column 4).

The maintenance categories (levels) AVUM, AVIM, and DEPOT are listed on the Maintenance Allocation Chart with individual columns that include the work times for maintenance functions at each maintenance level. Work time presentations such as "0.1" indicate the average time it requires a maintenance level to perform a specified maintenance function. If a work time has not been established, the columnar presentation shall indicate "— . — . Maintenance levels higher than the level of maintenance indicated are authorized to perform the indicated function.

B-7. TOOLS AND TEST EQUIPMENT (Column 5 and Section III).

Common tool sets (not individual tools), special tools, test, and support equipment required to perform maintenance functions are listed alphabetically in Section III with a reference number to permit cross-referencing to column 5 in the MAC. In addition, the maintenance category authorized to use the device is listed along with the item National Stock Number (NSN) and, if applicable, the tool number to aid in identifying the tool/device.

B-8. REMARKS (Column 6 and Section IV).

Remarks (identified by an alphabetic code in column 6) and other notes (identified by a number in parentheses in the applicable column) are listed in Section IV to provide a ready reference to the definition of the remark/note.

SECTION II.
MAINTENANCE ALLOCATION CHART
FOR
COUNTERMEASURES SET
AN/ALQ-156(V)1

(1) GROUP NUMBER	(2) COMPONENT OR ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL			(5) TOOLS AND EQUIPMENT	(6) REMARKS CODE
			AVUM	AVIM	DEPOT		
00	Countermeasures Set, AN/ALQ-156 (V) 1	Inspect	0.3				A
		Test	0.2				B
		Repair	0.3			1	C
01	Receiver/ Transmitter RT-1220/ ALQ-156(V)	Replace	0.3			1	
		Repair	0.1				G
		Test		5.0		1-6,9,14	
		Repair		0.3		1,4	D
		Test			8.0	2-7,9,11, 13,14,16,23, 24, 26, 33-38	
		Repair			1.0	4,7	
0101	CCA, Range Gate Channel 1	Replace		0.1		1,4	
		Test			16.0	8,10,13, 16,29	
		Repair			2.0	7	
0102	CCA, Mixer/ Clutter Filter, Channel 1	Replace		0.1		1,4	
		Test			16.0	8-11,16,19, 29	
		Repair			2.0	7	
0103	CCA, Range Gates Channel 2 and 3	Replace		0.1		1,4	
		Test			16.0	8-10, 13, 16,29	
		Repair			2.0	7	
0104	CCA, Mixer/ Clutter Filter, Channel 2	Replace		0.1		1,4	
		Test			16.0	8,10,11,16 19,29	
		Repair			2.0	7	
0105	CCA, Mixer/ Clutter Filter, Channel 3	Replace		0.1		1,4	
		Test			16.0	8,10,11,16, 19,29	
		Repair			2.0	7	

(1) GROUP NUMBER	(2) COMPONENT OR ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL			(5) TOOLS AND EQUIPMENT	(6) REMARKS CODE
			AVUM	AVIM	DEPOT		
0106	CCA Set, Synchronizer	Test		0.3		1, 2, 26	
		Repair		0.1			E
0107	CCA Set, Signal Processor	Test		0.3		1, 2, 26	
		Repair		0.1			E
0109	Power Supply Assembly	Replace		0.2		1	
		Test			16.0	6,8,12,19, 20,23,24	
		Repair			2.0	7	
010901	CCA,+5V Regulator/ Inverter Control	Replace			0.2	7	
		Test			7.0	6,8,21	
		Repair			1.0	7	
010902	CCA, +32V Regulator	Replace			0.2	7	
		Test			7.0	6, 8, 15, 25, 27	
		Repair			1.0	7	
010903	CCA, ±15V, ±24V, ±47V Regulator	Replace			0.2	7	
		Test			7.0	6, 8, 15, 18, 22, 27	
		Repair			1.0	7	
01010	Duplexer	Replace		0.4		1,4	
		Repair					F
01011	First IF Assembly	Replace		0.3		1,4	
		Repair					F
01012	Power Amplifier	Replace		0.3		1,4	
		Repair					F
01013	Frequency Multiplier Oscillator	Replace		0.3		1,4	
		Repair					F
01017	Wiring Harness, RT	Test			1.0	3,6	
		Repair			1.0	7	
01018	CCA, Countermeasures Heat	Replace		0.3		1	
		Test			1.0	6,28,32	
		Repair			1.0	7	

(1) GROUP NUMBER	(2) COMPONENT OR ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE LEVEL			(5) TOOLS AND EQUIPMENT	(6) REMARKS CODE
			AVUM	AVIM	DEPOT		
	Control Indicator C-10131/ ALQ-156(V)	Repair	0.1				G
		Replace	0.2			1	
		Test		0.5		1,2	
		Repair		0.5		1	H
		Test			0.5	30,31	
		Repair			1.0	7	
201	CCA, Control Indicator	Replace		0.3		1	
		Test			1.0	15,17	
		Repair			0.5	7	
202	Wiring Harness, Control Indicator	Test			1.0	3,6	
		Repair			1.0	7	

SECTION III.
MAINTENANCE ALLOCATION CHART
TOOL AND EQUIPMENT REQUIREMENTS
FOR
COUNTERMEASURES SET
AN/ALQ-156(V)1

(1) REFERENCE CODE	(2) MAINTENANCE LEVEL	(3) NOMENCLATURE	(4) NATIONAL STOCK NUMBER	(5) TOOL
1	AVUM, AVIM	Tool Kit TK-101/G	5180-00-064-5178	
2	AVIM, DEPOT	Test Set TS-3609/ALQ-156(V)	6625-01-142-3433	
3	AVIM, DEPOT	Oscilloscope AN/USM-281C	6625-00-106-9622	
4	AVIM, DEPOT	Torque Wrench, 8 in/lb fixed, with 5/16" open end	5120-00-169-5776	
5	AVIM, DEPOT	Power Meter ME-441/U	6625-00-138-6522	
		with		
		Thermistor Mount MX-7772/U	6625-00-886-1955	
6	AVIM, DEPOT	Multimeter AN/PSM-45	6625-01-139-2512	
7	DEPOT	Tool Kit TK-100/G	5180-00-605-0079	
8	DEPOT	Oscilloscope OS-261/U	6625-00-127-0079	
9	AVIM, DEPOT	Probe, X10	6625-00-078-5219	
10	DEPOT	Signal Generator	6625-01-097-0440	
11	DEPOT	Voltmeter, AN/USM-224(U)A	6625-00-727-4706	
12	DEPOT	Junction Box SM-A-951585		
13	DEPOT	Spectrum Analyzer AN/USM-489	6625-01-079-9495	
14	AVIM, DEPOT	Frequency Counter TD-1225(V)2/U	6625-01-121-6934	

(1) REFERENCE CODE	(2) MAINTENANCE LEVEL	(3) NOMENCLATURE	(4) NATIONAL STOCK NUMBER	(5) TOOL
15	DEPOT	Power Supply PP-6547/U	6625-00-823-5359	
16	DEPOT	Variable Attenuator	5985-00-525-5075	
17	DEPOT	Cont. Ind. CCA Test Fixture SM-A-951596		
18	DEPOT	Power Supply CCA Test Fixture SM-A-951584		
19	DEPOT	Spectrum Analyzer TS3628(V) 1/U	6625-00-359-1927	
20	DEPOT	Power Supply Test Fixture SM-A-951585		
21	DEPOT	Power Supply CCA Test Fixture SM-A-951582		
22	DEPOT	Pulse Generator	6625-00-531-5135	
23	DEPOT	Autotransformer and VAC Meter SM-A-951585		
24	DEPOT	Wattmeter		
25	DEPOT	Power Supply CCA Test Fixture SM-A-951583		
26	AVIM, DEPOT	Maintenance Assistance Module (MAM) SM-D-991746		
27	DEPOT	Sinewave Generator AN/URM-127	6625-00-783-5965	
28	DEPOT	CM Heat CCA Test Fixture SM-A-991697		
29	DEPOT	2nd IF Test Fixture SM-A-921062		

(1) EFERENCE CODE	(2) MAINTENANCE LEVEL	(3) NOMENCLATURE	(4) NATIONAL STOCK NUMBER	(5) TOOL
30	DEPOT	Power Supply	6625-00-253-9230	
31	DEPOT	Control Indicator Test Fixture SM-A-951597		
32	DEPOT	Power Supply		
33	DEPOT	Frequency Standard		
34	DEPOT	Frequency Synthesizer	6625-01-096-2982	
35	DEPOT	RF Detector	6625-01-035-0626	
36	DEPOT	Probability of Detection Fixture SM-A-920758		
37	DEPOT	Data Monitor Test Fixture SM-A-920758		
38	DEPOT	Directional Coupler. 20db	5985-00-525-5370	
39	DEPOT	Prime Power Monitor Fixture SM-A-920758		

SECTION IV.

MAINTENANCE ALLOCATION CHART SUPPLEMENTARY INSTRUCTIONS AND REMARKS FOR COUNTERMEASURES SET AN/ALQ-156(V)1

REMARKS CODE	EXPLANATION
A	Weekly inspection.
B	Preflight and postflight operational test.
C	Repair by removal and replacement of one or more Line Replaceable Units (Receiver/Transmitter, Control Indicator, or Antenna).
D	Repair includes replacement of repairable circuit cards, power supply, and modules; throwaway items: interconnection circuit card, four synchronizer circuit cards (digital interface, timing, bite, and microprocessor), four signal processor cards (reference generator/multiplier, accumulater/envelope detector, post detection integrator, and deltic memory control), directional coupler, power divider, blower, elapsed time meter, and twenty hardline cables. **NOTE** **The four-card synchronizer and signal processor sets are fault isolated by substitution using the Maintenance Assistance Module (MAM), and the defective card is returned to the depot for disposition.**
E	Repair by removal and replacement of one or more circuit cards in the set.

REMARKS CODE	EXPLANATION
F	Vendor item—return to depot for disposition.
G	Repair by removal and replacement of lamp only.
H	Repair by replacement of the replaceable circuit card assembly and throwaway items: switches, switch guard, and illuminated panel. Only repairs to the wiring harness and its connectors require return of the Control Indicator to the depot.

APPENDIX C
COMPONENTS OF END ITEM AND BASIC ISSUE ITEMS LISTS

SECTION I.
INTRODUCTION

-1. SCOPE

his appendix lists components of end item and basic issue items for the N/ALQ-156(V)1 countermeasures set to help you inventory items required r safe and efficient operation.

-2. GENERAL

he Components of End Item and Basic Issue Items Lists are divided into the llowing sections:

Section II. Components of End Item. This listing is for informational pur·oses only, and is not authority to requisition replacements. These items are rt of the end item, but are removed and separately packaged for transporta-n or shipment. As part of the end item, these items must be with the end item henever it is issued or transferred between property accounts. Illustrations e furnished to assist you in identifying the items.

Section III. Basic Issue Items. These are the minimum essential items quired to place the countermeasures set in operation, to operate it, and to rform emergency repairs. Although shipped separately packaged, BII must with the countermeasures set during operation and whenever it is trans-rred between property accounts. The illustrations will assist you with hard-identify items. This manual is your authority to request/requisition BII, sed on TOE/MTOE authorization of the end item.

-3. EXPLANATION OF COLUMNS

e following provides an explanation of columns found in the tabular listings:

Column (1) — Illustration Number (Illus Number). This column indicates the mber of the illustration in which the item is shown.

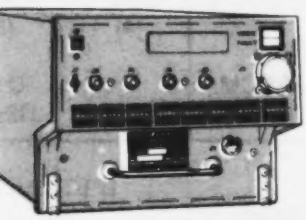
Column (2) — National Stock Number. Indicates the National stock number signed to the item and will be used for requisitioning purposes.

c. Column (3) — Description. Indicates the Federal item name and, if required, a minimum description to identify and locate the item. The last line for each item indicates the FSCM (in parentheses) followed by the part number.

d. Column (4) — Unit of Measure (U/M). Indicates the measure used in performing the actual operational/maintenance function. This measure is expressed by a two-character alphabetical abbreviation (e.g., ea, in, pr).

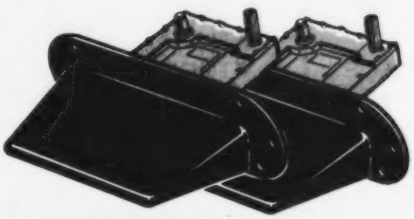
e. Column (5) — Quantity required (Qty reqd). Indicates the quantity of the item authorized to be used with/on the equipment.

SECTION II.
COMPONENTS OF END ITEM

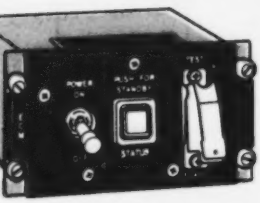


RECEIVER TRANSMITTER

3



ANTENNA (2)



CONTROL
INDICATOR

(1) ILLUS NO.	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION FSCM AND PART NUMBER	(4) U/M	(5) QTY REQD
1	5841-01-134-5832	RECEIVER TRANSMITTER RT-1220/ALQ-156(V) (80063) SM-D-920682	EA	1
2	5841-01-134-3163	CONTROL INDICATOR C-10131/ALQ-156(V) (80063) SM-D-991625	EA	1
3	5985-01-134-3161	ANTENNA AS-3149/ALQ-156(V) (80063) SM-D-920683	EA	2

SECTION III.
BASIC ISSUE ITEMS

(1) ILLUS NO.	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION FSCM AND PART NUMBER	(4) U/M	(5) QTY REQD
		(NONE IDENTIFIED)		

APPENDIX D
ADDITIONAL
AUTHORIZATION LIST

SECTION I.
INTRODUCTION

1. SCOPE

This appendix lists additional items you are authorized for the support of the AN/ALQ-156(V)1 countermeasures set.

2. GENERAL

This list identifies items that do not have to accompany the AN/ALQ-156(V)1 countermeasures set and that do not have to be turned in with it. These items are all authorized to you by CTA, MTOE, TDA, or JTA.

3. EXPLANATION OF LISTING

National stock numbers, descriptions, and quantities are provided to help you identify and request the additional items you require to support this equipment. The items are listed in alphabetical sequence by item name under the type document (i.e., CTA, MTOE, TDA, or JTA) which authorizes the item(s) to you.

SECTION II.
ADDITIONAL AUTHORIZATION LIST

(1) NATIONAL STOCK NUMBER	(2) DESCRIPTION PART NUMBER & FSCM	USABLE ON CODE	(3) U/M	(4) QTY AUTH
	Band Pass Filter and Cable Assembly Part No. SM-C-991657	EX4	EA	1

APPENDIX E
EXPENDABLE SUPPLIES AND MATERIALS LIST

SECTION I.
INTRODUCTION

E-1. SCOPE

This appendix lists expendable supplies and materials you need to operate and maintain the AN/ALQ-156(V)1 countermeasures set. These items are authorized to you by CTA 50-970, Expendable Items (Except Medical, Class V, Repair Parts, and Heraidic Items).

E-2. EXPLANATION OF COLUMNS

a. Column (1) — Item number. This number is assigned to the entry in the listing and is referenced in the narrative instructions to identify the material (e.g., "Use sealant, item 1, App. E")

b. Column (2) — Level. This column identifies the lowest level of maintenance that requires the listed item.

O—Aviation Unit Maintenance (AVUM)
F—Aviation Intermediate Maintenance (AVIM)

c. Column (3) — National Stock Number. This is the National stock number assigned to the item; use it to request or requisition the item.

d. Column (4) — Description. Indicates the Federal item name and, if required, a description to identify the item. The last line for each item indicates the Federal Supply Code for Manufacturer (FSCM) in parentheses followed by the part number.

e. Column (5) — Unit of Measure (U/M). Indicates the measure used in performing the actual maintenance function. This measure is expressed by a two-character alphabetical abbreviation (e.g., ea, in, pr). If the unit of measure differs from the unit of issue, requisition the lowest unit of issue that will satisfy your requirements.

SECTION II.
EXPENDABLE SUPPLIES AND MATERIALS LIST

(1) ITEM NUMBER	(2) LEVEL	(3) NATIONAL STOCK NUMBER	(4) DESCRIPTION	(5) U/M
1	0		Sealant, Dow Corning 732-3RTV or equivalent	A/R
2	0		Wire, Safety 0.032	Spool
3	0	8305-00-205-3496	Cloth, lint-free, cleaning CCC-440	PK
4	0		Brush, paint	EA
5	0	6850-00-105-3084	Trichlorotrifluoroethane	QT

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Stateside, N.J. 07703

DATE SENT
10 July 1975

PUBLICATION NUMBER	PUBLICATION DATE	PUBLICATION TITLE
TM 11-5840-340-12	23 Jan 74	Radar Set AN/PRC-76

BE EXACT PIN-POINT WHERE IT IS

PAGE NO	PARAGRAPH	FIGURE NO	TABLE NO	IN THIS SPACE TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT:
2-25	2-28			Recommend that the installation antenna alignment procedure be changed throughout to specify a 2^{o} IFF antenna lag rather than 1^{o}. REASON: Experience has shown that with only a 1^{o} lag, the antenna servo system is too sensitive to wind gusting in excess of 25 knots, and has a tendency to rapidly accelerate and decelerate as it hunts, causing strain to the drive train. Hunting is minimized by adjusting the lag to 2^{o} without degradation of operation.
0	3-3		3-1	Item 5, Function column. Change "2 db" to "3db." REASON: The adjustment procedure for the TRANS POWER FAULT indicator calls for a 3 db (500 watts) adjustment to light the TRANS POWER FAULT indicator.
5-6	5-8			Add new step f.1 to read, "Replace cover plate removed in step e.1, above." REASON: To replace the cover plate.
		F03		Zone C 3. On J1-2, change "+24 VDC to "+5 VDC." REASON: This is the output line of the 5 VDC power supply. +24 VDC is the input voltage.

SAMPLE

TYPED NAME, GRADE OR TITLE AND TELEPHONE NUMBER
SSG I. M. DeSpiritof 999-1776

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USE OF METRIC MEASURING SYSTEM

In this manual, you'll find weights and measurements given in American Standard units with the same measurement in Metric units shown in parentheses.

Tools, or nuts and bolts that have been manufactured in American Standard units are described in those units. For example: 1/2 inch hex nut, 3/4 inch bolt, 1/2 inch wrench.

Use the following Metric/American Standard table as a measurement guide for any conversions you have to make.